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COVER—Two Skywarriors from VAK-208, NAS Alameda, Calif., were caught in a dramatic sunset near Mount Shasta by McDonnell Douglas photographer Harry Gann. Inside, an F-4B Phantom launches from the carrier Coral Sea during a WestPac cruise.

Features

Departments

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STATE OF THE ART

S-3 Viking Update Lockheed-California Company and the Naval Air Systems Command have finalized a full-scale engineering development contract valued at $187 million for an improved avionics system for the S-3 *Viking* carrier-based antisubmarine warfare aircraft. The contract includes the design and development of equipment and the modification and testing of two S-3As, which will be redesignated S-3Bs. These aircraft are scheduled for delivery to the Navy by October 1985 for testing and evaluation. Eventually, a total of 160 S-3As could be updated to the S-3B configuration.

Among the improvements included under the new program are increased acoustic and radar processing, expanded electronic support measure coverage, a new sonobuoy receiver system and the *Harpoon* missile.

NATC Electrical Inspectors The Patuxent River Naval Air Test Center (NATC) electrical inspectors provide a valuable and life-saving service through their inspections of naval aircraft electrical/avionics wiring and equipment.

Inspections are conducted during Navy Preliminary Evaluations and Board of Inspection and Survey trials to ensure the electrical and avionics systems and wiring are adequate and accessible, and that performance, growth potential, reliability, maintainability, safety and mission suitability requirements are met. The NATC inspectors are also part of the Naval Air Systems Command surveillance inspection team which provides similar support to aircraft in production and being reworked at contractors' plants and naval air rework facilities. Due to the ever-increasing complexity and high density of aircraft wiring and electronic equipment, the surveillance inspection program was established to provide continuing vigilance to eliminate discrepancies in naval aircraft at various stages of their development and service lives.

The detection and elimination of discrepancies, such as wire chafing conditions that could result in arcing or damage to circuits involved, or foreign debris in avionics compartments which could short electrical terminals or foul control cables and linkages, have made naval aircraft safer to fly.

McDonnell Douglas Corporation

Wire chafing conditions, if not detected and corrected, can result in aircraft fires, as evidenced by these charred wire bundles. Luckily, this fire occurred during a ground turn and not during flight.

VAdm. Schoultz New DCNO (Air Warfare)

PH1 Mike Denson

The new Gray Eagle has a new perch at the top. Vice Admiral R. F. "Dutch" Schoultz relieved Vice Admiral Wesley L. McDonald as Deputy Chief of Naval Operations (Air Warfare) September 2, and in doing so also became the first holder of the Gray Eagle title to serve concurrently as Naval Aviation's top man.

VAdm. Schoultz was the 33rd pilot to become the Navy's Gray Eagle in ceremonies June 26 while he was Commander Naval Air Force, U.S. Pacific Fleet, headquartered in San Diego. Gray Eagle is an honorary title periodically passed to the active duty aviator with the earliest date of designation.

At change of command ceremonies prior to leaving the job of ComNavAirPac, VAdm. Schoultz received the Distinguished Service Medal and high praise from Chief of Naval Operations Admiral James D. Watkins. "Throughout the two-and-one-half-year period," said Adm. Watkins, "VAdm. Schoultz displayed an unparalleled ability in administering the myriad complex requirements involved in the administration and operations of the Pacific Fleet land and sea-based aircraft, aircraft carriers, and associated bases and support activities."

Speaking informally at his new Pentagon headquarters, VAdm. Schoultz expressed his pleasure and pride in being selected as the new DCNO for air warfare. "During my long service in Naval Aviation, I have been continually impressed with the dynamic quality of our people. And I have had the opportunity to see them meet and overcome every challenge, in combat and peacetime operations. Now to be the representative for Naval Aviation in the Washington scene is an ultimate dream come true."

Schoultz noted more challenges in the near future as well as the long haul and emphasized a continuation of the effort to ". . .instill in each member that basic awareness that as a member of Naval Aviation he or she is a special person assigned to an elite organization.

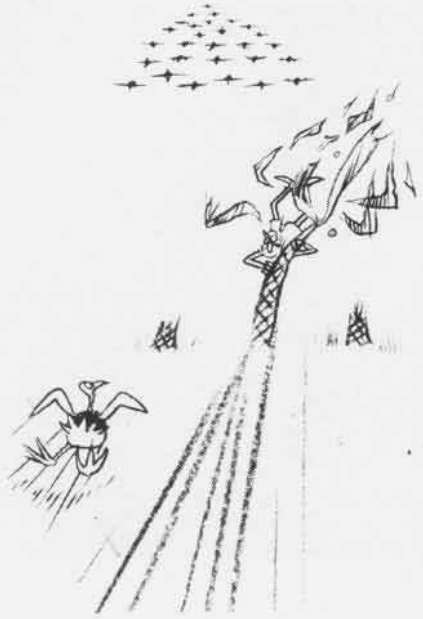
"Together, all of us in Naval Aviation can continue to build on and further our great heritage of service to our Navy and our nation. I promise you all my very best shot!" he said in conclusion.

VAdm. Schoultz' predecessor, VAdm. McDonald, has been selected for a fourth star. The appointment to the rank of admiral was approved by President Reagan in August, and he was frocked by Adm. Watkins at a ceremony in the Pentagon on September 1. Adm. McDonald relieved Admiral Harry D. Train II in September as Commander in Chief, Atlantic; Commander in Chief U.S. Atlantic Fleet; and NATO's Supreme Allied Commander, Atlantic.

Left, VAdm. R. L. "Dutch" Schoultz, new Deputy Chief of Naval Operations (Air Warfare). Above, the new aviation boss takes the controls during demonstration of the XV-15 V/STOL aircraft.

In a brief ceremony, outgoing DCNO(Air Warfare) Vice Admiral Wesley McDonald was bid farewell by Grampaw Pettibone in the form of an original sketch by noted artist Bob Osborn.

Grampaw Pettibone

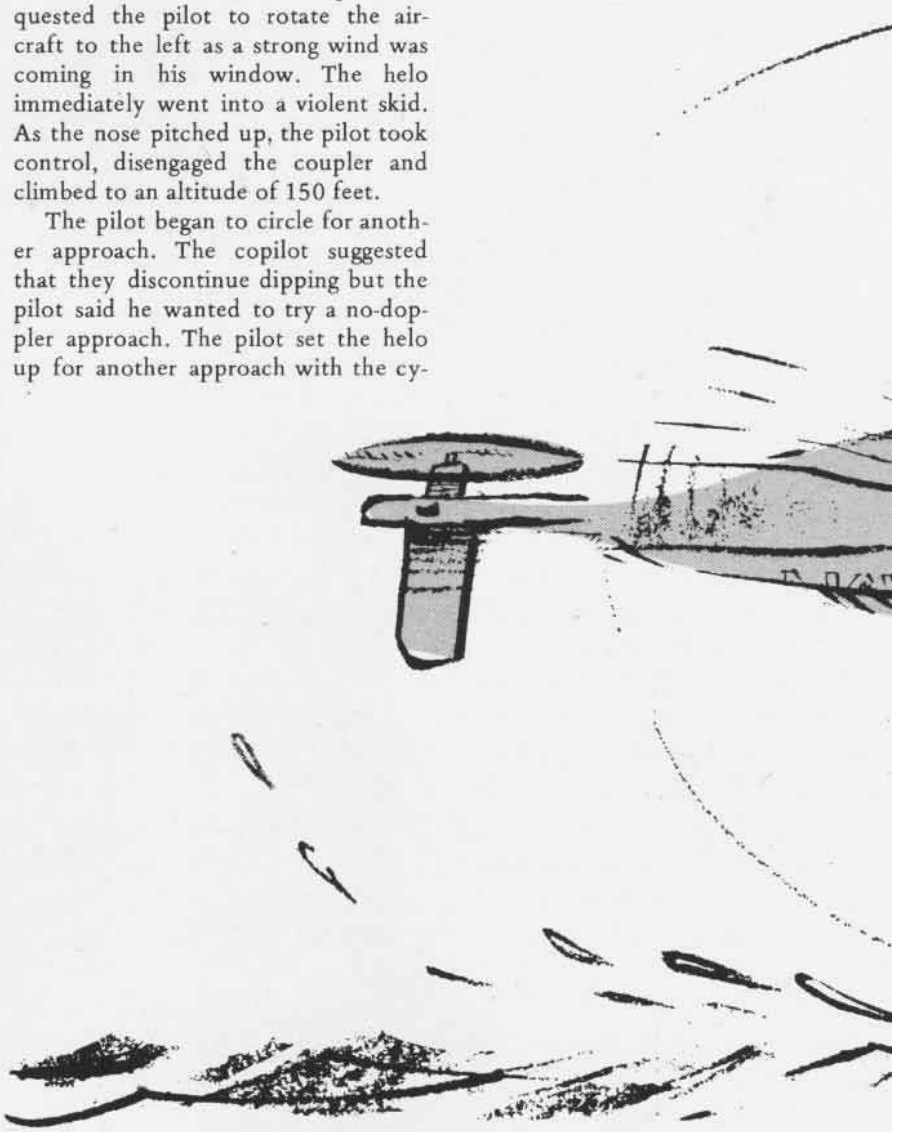


Helpless Helo

An SH-3A departed a CVS off the East Coast for a routine night ASW mission. Weather at the ship was clear with no moon and the helo proceeded to the datum area at 500 feet and 115 knots. By the time the helicopter reached datum, there was no horizon and an S-2D plane commander who was on station advised the helo pilots that doppler conditions were poor. He recommended that no-doppler approaches be attempted because of a very smooth sea state. He also informed them that one helicopter had already departed the area with possible damage to the sonar dome.

Prior to departing the smoke light for the first dip station, the pilot experienced vertigo. He gave the copilot control of the helo and instructed him to try an automatic doppler approach first. At 150 feet and 75 knots, the coupler was engaged and the helo immediately started to roll from side to side. At an altitude of 100 feet, the roll became more pronounced. The nose started to move up and down. At 80 feet, control became even more erratic and the copilot informed the pilot that he was going to terminate the approach but the pilot told him to continue and see if it would settle down. At about 50 feet and 40 knots, the copilot requested the pilot to rotate the aircraft to the left as a strong wind was coming in his window. The helo immediately went into a violent skid. As the nose pitched up, the pilot took control, disengaged the coupler and climbed to an altitude of 150 feet.

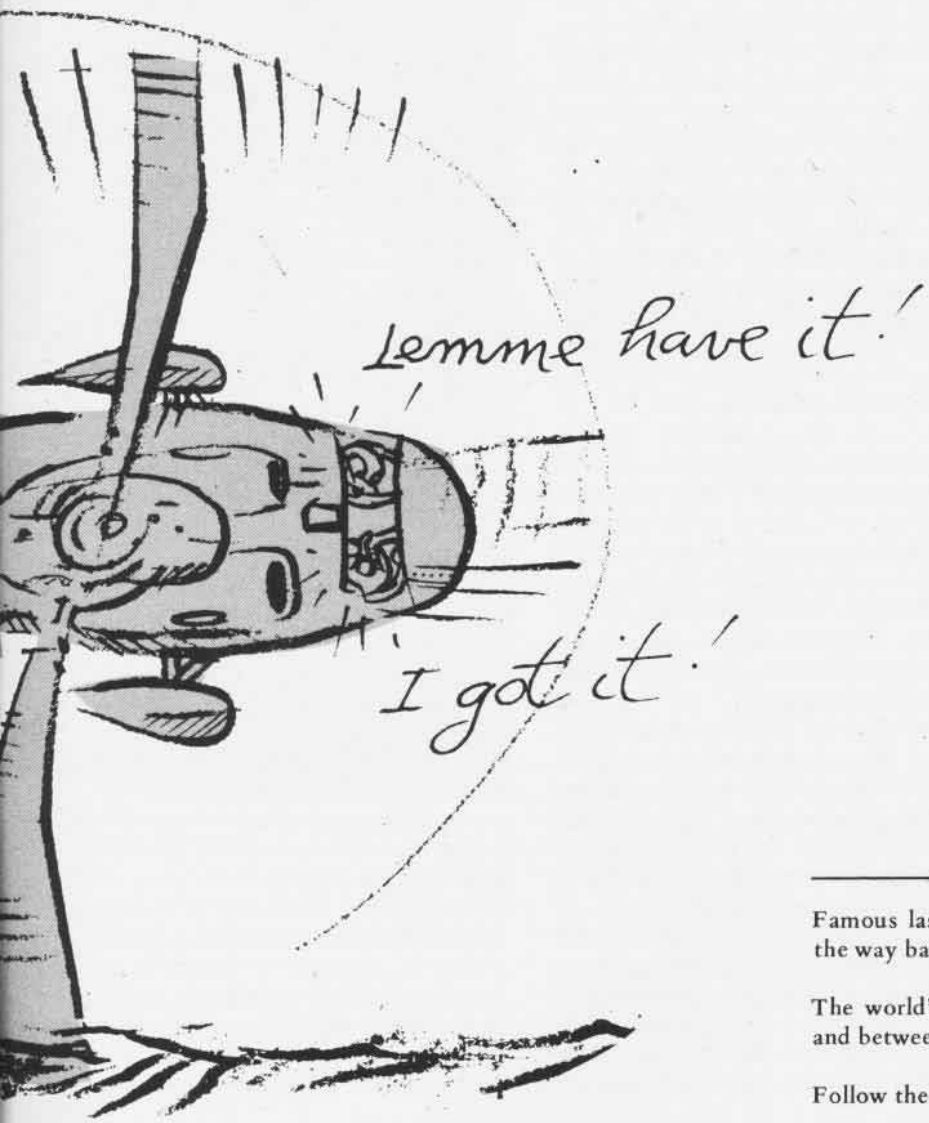
The pilot began to circle for another approach. The copilot suggested that they discontinue dipping but the pilot said he wanted to try a no-doppler approach. The pilot set the helo up for another approach with the cyclic coupler off and instructed the copilot to switch to the doppler mode as they passed through 80 feet. The coupler was engaged at 150 feet and, at 80 feet, the copilot switched to doppler as instructed. Almost immediately, everything became very erratic with the aircraft attaining some weird attitudes. The pilot quickly disen-



ILLUSTRATED BY Osborn

gaged the coupler in a desperate attempt to recover.

When the aircraft entered a near-uncontrolled attitude, the copilot said, "I have it," because he thought the pilot had vertigo, but the pilot said he still had it. The collective was in the full-up position during most of the recovery attempt. At one time, the copilot noted the gyro horizon indicated 20 degrees nose up. Both pilots fought the aircraft for the next few seconds but were unable to regain control. The aircraft contacted the water in a nose-down, right-wing-down attitude, and immediately rolled to the right. The crew abandoned the helo and were rescued by whaleboats from two destroyers operating in the area. Two of the crewmen suffered from exposure but otherwise were all right.




Grampaw Pettibone says:

Jumpin' Jehoshaphat! These lads worked like beavers to booby-trap themselves and darn near bought the farm doing it.

I'll admit a pretty weird set of conditions got together during this fiasco, but a little good judgment based on sound operating procedures could have saved the crew a cold swim and Uncle Sam a costly helo.

When you completely ignore the advice of other pilots in the area and pay no attention to such clues as vertigo, disorientation, haze, poor horizon and the better judgment of your copilot, you're really askin' for it.

After this thing reached a point of no return, both pilots got on the controls and ended up fighting each other until the helpless helo crashed. Cockpit discipline like this will get you nothing but a peck of trouble.

These destroyer boys have fished a lot of birdmen out of the drink. It's mighty comforting to know they're around and eager to lend a helping hand. My hat is off to them any time. This helo crew would have been in real bad shape if the DDs hadn't been around for this one.

(Reprinted from November 1964)

Famous last words—"I can make it. I'll just lean it all the way back."

The world's best safety device is situated slightly above and between your ears—use it.

Follow the rules and give the poor taxpayers a break.

F6F-5N night fighters in a rare grouping.

Black Chickens and Bat Teams

This is a reprint of an article which appeared in Naval Aviation News in March 1972 by:

VAdm. William I. Martin, USN(Ret.)
VAdm. Turner F. Caldwell, USN(Ret.)
Cdr. Edwin R. Jenks, USN(Ret.)

Prior to WW II, the Navy placed little emphasis on instrument flying and few pilots were really proficient at "flying the gauges." Carrier squadrons were effective only during daylight – and only in weather which permitted orientation by visual contact with the surface of the earth. Pilots were required to be "night carrier qualified"; however, the qualifications, consisting of six night takeoffs and landings, were conducted only when there was good visibility under moonlight conditions. The carriers and the squadrons were greatly relieved when these once-a-year ordeals were over.

In fairness to those old-timers, pilots of modern carrier aircraft should bear in mind that flight instruments were primitive and unreliable; navigation facilities provided approximate azimuth but no range information. There were no radars, so pilots received no position or collision avoidance assistance from the carrier. There were many hairy tales about planes being unable to return to their carrier because of weather conditions. Without radar and adequate weather forecasting assets, the carrier frequently was surprised to find herself in low visibility areas. At night pilots had no means of avoiding clouds and bad weather areas. To a pilot unskilled in instrument flying, it is nightmarish to be unable to orient visually with the earth. It is little wonder that night flying was extremely unpopular among carrier pilots – in fact, they jokingly spoke of instrument flying as "needle, ball and rip cord."

Parenthetically, it should be stated that our potential enemy in the Pacific was no better off. It is possible, however, that the kamikaze cells in his blood stream obscured his fear of the operational risks involved.

A short time before WW II, Navy pilots began hearing about an electronic device called "radar" which, if it could be installed in an aircraft, would be able to detect things and give the pilots bearings and distances. For Navy pilots proficient in instrument flying, the promise of eyes to see through darkness and bad weather was indeed exciting.

In 1941, as tensions increased, the Navy placed much greater emphasis on instrument flight training and initiated procurement of airborne radar for carrier-type aircraft. Even greater attention was applied when WW II started.

Under the pressure of combat, night carrier operations took two separate paths, led by separate groups of people. These were the development of night attack and night intercept operations. These specialties soon began to converge until by the summer of 1944 it was possible to form a night combat air group, CVLG(N)-41, aboard *Independence*. Soon thereafter, she was joined by *Enterprise* with CVG(N)-90 embarked.

Night Fighters

Requirements grow out of enemy capabilities and, therefore, the development of carrier-based night fighters grew out of operating requirements in the early days of the war in the Pacific. This is not to denigrate the excellent carrier operations in the Atlantic – but the main story is that of the Pacific.

The Japanese were forced to develop tactics for night reconnaissance and attack in order to react to the movements of U.S. forces. In operations in the Solomons during the summer of 1942, the Japanese found that their losses in night operations were only a fraction of those during daylight, and that they were accomplishing useful results. The tactics developed for night torpedo attacks against U.S. ships consisted of shadowing the formation until the composition was known, then dropping flares on one side. The torpedo-carrying aircraft would then attack from the other side with their targets silhouetted against the light of the flares. *Denver* was the victim of these tactics on November 13, 1943, during the Bougainville operation. A month later, these tactics were used against us in the Marshall Islands, re-

sulting in the torpedoing of *Lexington.* The frequency and effectiveness of Japanese night air attacks grew as the Pacific War continued and as operations led us closer to Japanese bases.

We were thus forced into the night sky by our enemy. His tactics and aggressiveness initiated the program which was to produce our night fighter pilots.

In April 1942, the Navy started Project *Affirm* at Quonset Point, R. I. Under Captain E. J. Taylor, USNR, who had night fighter experience with the British in 1941, the Navy — with the help of the Sperry Company and the Massachusetts Institute of Tech-

F6F, propeller still whirling, exhales a blue flash from its exhaust as it settles on an escort carrier deck.

nology — developed the equipment and trained the pilots necessary to gain control of the night sky.

The first operational night fighter units were a squadron of six F4U *Corsairs* under Commander William J. Widhelm, and a squadron of six twin-engine Lockheed *Ventura* patrol planes commanded by Lieutenant Colonel Frank N. Schwable, USMC. These squadrons, land-based in the Southwest Pacific, did much to develop night air intercept tactics, particularly the techniques of working with combat information centers.

The first night intercept attempts from a carrier were carried out during the Gilbert Islands operations in November 1943, Lieutenant Commanders John L. Phillips and Edward H. O'Hare, of *Enterprise,* were given permission to attempt night intercepts with a *Hellcat* fighter and an *Avenger* torpedo bomber, using the search radar (ASB-1) of the latter to locate the target. This effort, with minimum equipment and training, broke up a large-scale Japanese attack. Unfortunately, "Butch" O'Hare was lost.

By early 1944, night-trained pilots were being assigned to various carriers as four-plane units. Each unit was an integrated team of pilots with a specially trained fighter/director officer and maintenance personnel. Pete Aurand, Jim Gray and Pete Peterson were three among nearly a dozen officers who led these early detachments. Their feedback of information to the training facility in Rhode Island was invaluable.

Night Fighter Squadron 79, (VF (N)-79), with 18 F6F *Hellcats,* commanded by Commander Turner F. Caldwell, was assigned to *Independence* (Captain E. C. Ewen commanding) in early July 1944. Shortly thereafter, the previously mentioned convergence of night fighter and night attack capabilities occurred. A squadron of nine TBF *Avengers* under Lieutenant R. A. "Rebel" Taylor was assigned to *Independence* and the group was designated CVLG(N)-41.

The effectiveness of night fighter operations was dramatically demonstrated in one incident during the passage of Task Force 38 through the Bashi Channel between Formosa and Luzon, en route to the South China Sea. A CVLG(N)-41 fighter pilot, Ensign W. W. Williams, shot down a Japanese transport airplane (evacuating people from the Philippines) directly over the fleet flagship, USS *Hancock.* The fuselage struck the water a few yards to starboard, the engines to port. Admiral J. S. McCain, Task Force Commander, came on the radio to congratulate all concerned. His teeth chattered so from excitement that he was scarcely intelligible.

Night Attack

Air Group Ten, deployed aboard *Enterprise* in 1942, took a special interest in instrument flying and developed the Navy's first instrument flight manual applied to the specific needs of carrier squadrons. At the end of that combat tour, a few of its instrument flight enthusiasts volunteered to form the nucleus of a new Torpedo Squadron Ten because it was to be the first carrier squadron completely outfitted with radar-equipped TBFs.

These Grumman torpedo bombers then carried a primitive radar designated ASB. Presentations on its scope were subtle and elusive; interpreting was like learning a strange language. Many weeks of intensive work were necessary to train radar operators to navigate and to coach the pilot through bombing attacks.

The second Air Group Ten deployed to the Western Pacific, again aboard *Enterprise,* in 1943. *Torpecker Ten,* as the torpedo bomber squadron was affectionately known, had sharpened its skill in low-level night attack. Aircraft morale was high. It was their conviction that losses due to enemy action — AA and night fighters — would be much lower at night. Night flying admittedly involved higher operational risks; however, these were proportional to the skill of the aircrew.

Contributing also to their high motivation was a realization that if they could operate successfully at night, they could shorten the war. The enemy was servicing his aircraft and repairing his airfields and ships at night. Redeployment of aircraft and staging for future operations were carried out under cover of darkness. By taking the offensive to the enemy at night, we could disrupt these operations and keep him off balance until dawn, when our daytime air offensive would take over. We would give his forward area people a bad case of insomnia.

Because night attack was new and

A TBF Avenger is stark evidence that night carrier landings were more demanding.

untried, there was reluctance initially on the part of task force commanders to employ Torpedo Squadron Ten in a night role. Its first opportunity to prove its capability came in February 1944 when it was permitted to attack Truk the night before planned daylight operations. It was a very black night when *Enterprise* launched 12 radar-equipped TBFs to attack enemy ships anchored in Truk Lagoon. Applying a masthead level bombing technique developed by the squadron, each plane made at least two low-altitude runs releasing one or two 500-pound bombs on each run, depending on pilot/radar operator confidence that the target was a ship rather than one of the many very small islands or rocks in the lagoon which gave a ship-size radar return.

That night the feasibility and effectiveness of night carrier attack were proved. Two tankers and six freighters were sunk and five other ships were left burning. All but one of the TBFs returned safely to *Enterprise*. The success of that mission gave strong support to the night attack carrier air group concept.

Subsequently, Commander William I. Martin, with a few volunteers from old Scouting Squadron Ten and many volunteers from Torpedo Squadron Ten, formed the nucleus of Night Air Group 90 (CVG(N)-90). Through a very happy turn of events, *Enterprise* was designated the carrier, CV(N)-6, which would take the night air group into combat.

Because of time constraints, Night Attack Squadron 90 (VT(N)-90) formed and trained in Hawaii where it was joined by Night Fighter Squadron 90 (VF(N)-90). In optimizing the TBF for night attack, the squadron made some weight reduction proposals which higher authority disapproved. In order to carry more ordnance and improve the safety of overload night takeoffs, the squadron wished to remove the turret, the tail gun and all armor plate — totaling about 1,700 pounds. When Cdr. Martin appeared before Admiral John H. Towers to appeal the disapproval, the admiral said that his aeronautical engineers had advised him that removal of those items would dislocate the CG so that the aircraft would not fly; furthermore, the O&R people had advised him that the proposed modifications would take so long they could not be accomplished before the scheduled deployment. The commander responded with a request, "Admiral, I'd like to borrow a jeep to return to Barbers Point. Last night, in just a few hours, squadron personnel made the modifications we've proposed and I flew that TBF here to Ford Island this morning. In view of what I've just heard about that plane, sir, I sure won't attempt to fly it back!" The modifications were approved and priorities were assigned to assure their timely accomplishment.

The success of the night attack concept was made possible not only by skilled pilots but also by the officer and enlisted radar/navigator bombardiers. These "rear-seat" men with technical/operational expertise, dedication and fearless trust in their pilots were absolutely essential to this effort. The teamwork between pilot and crew was the most important factor in developing the overall capability. Each had to have the fullest confidence in the competence of the other.

Lieutenant Junior Grade E. R. "Bud" Jenks, radar countermeasure officer on Admiral Gardner's staff, was also assigned to the air group staff and flew as a radar/navigator bombardier. He installed ECM equipment in 10 TBFs and became the first ECM operator in combat.

Subsequent operations with makeshift ECM gear were perhaps the Navy's first effective and sustained tactical employment of what later came to be known as electronic warfare and now is a major facet in all areas of warfare applications.

In addition to the few names mentioned above, there were literally hundreds of *Enterprise* men who were key to the success of pioneering night operations — old-timers will recognize them: Bud Hall, Tom Hamilton, Roscoe Newman, Tommie Thomas, Killer Kane, Jack Blitch, Henry Loomis, Bill Chace, Russ Kippen, Charlie Henderson, Jim Plummer, Dal Runion and Logan McMillen.

Night Carriers and Air Groups

Enterprise joined the fleet as a night carrier in January 1945 and participated in operations with *Independence*. By this time, operating techniques had so improved that a large night air group was at last practical and a large carrier was required. The South China Sea operation proved that *Enterprise* was much superior in operating efficiency. When *Independence* completed her tour in February 1945 and returned to Pearl Harbor for upkeep, she was reconfigured for day combat operations. The remainder of the war saw night operations being conducted exclusively from large carriers — *Saratoga* and *Bon Homme Richard* in addition to *Enterprise*.

Enemy ship under bombing attack is silhouetted in the moonlight.

Independence and CVLG(N)-41, during their six months of combat operations, provided night defense and attack capabilities for the fleet from before MacArthur's landing at Leyte, through the vicious fighting in the Philippines in November and December 1944, culminating in the great sweep through the South China Sea in January 1945. The record shows 27 confirmed night kills, including 9 out of 12 giant *Emily* flying boats operating against Task Force 38 out of Manila Bay. (The other three were destroyed at their moorings.)

On Christmas Eve 1944, the newly designated night carrier *Enterprise*, with her night air group, sailed on what was to be the ship's last combat tour. This great ship had worked hard to prepare for night operations — modifications, technical changes and specialized training as involved as those confronted by the air group. Fortunately, *Independence* and her night air group, CVLG(N)-41, already operating successfully at night, were very helpful in passing on lessons learned. For example, technical changes such as special external lighting and the use of a deck edge mounted airborne radar (APS-4) for controlling the landing pattern were *Independence* innovations. A YE radio homing beacon had also been installed at Pearl Harbor.

Although the ship was designated a night carrier, circumstances in combat demanded that she operate around the clock. Her flight deck was always available for taking aboard the emergencies of all the day air groups. The night air group frequently was called on to perform daylight missions when the weather was too severe for the day air groups.

The commanding officer and the navigator spelled each other on the bridge. Looking back on the many times during night and day when general quarters, flight quarters and torpedo defense were sounded, one wonders how anyone ever slept.

Engagements against the enemy consisted of air strikes against Formosa, Luzon, Indochina, the China coast, Pratas Reef and Okinawa; support of landing operations on Luzon; strikes against the Tokyo-Yokohama area; support of landing operations on Iwo Jima; strikes against Kyushi, the Inland Sea of Japan, Kikai, Amami, Kyushu, and Shikoku.

This combat tour ended when a kamikaze plane crashed through the forward flight deck on the morning of May 14, 1945, blowing the forward elevator 400 feet vertically. *Enterprise* and Night Air Group 90 had completed five months of significant pioneering under combat conditions. In addition to undetermined damage to the enemy's war-making resources ashore, Night Air Group 90 had deprived the enemy of 38 ships and 115 aircraft — an impressive accomplishment!

After the war the legacy of night operations from these briefly sketched years was applied to "all-weather flying." Instruments, equipment, techniques and tactics were developed so that carrier-based aircraft can now operate in nearly any environment. Today's young pilot may find this second nature but, as in all man's endeavors, someone had to do it first, and the years 1942-1945 were essentially when they did it.

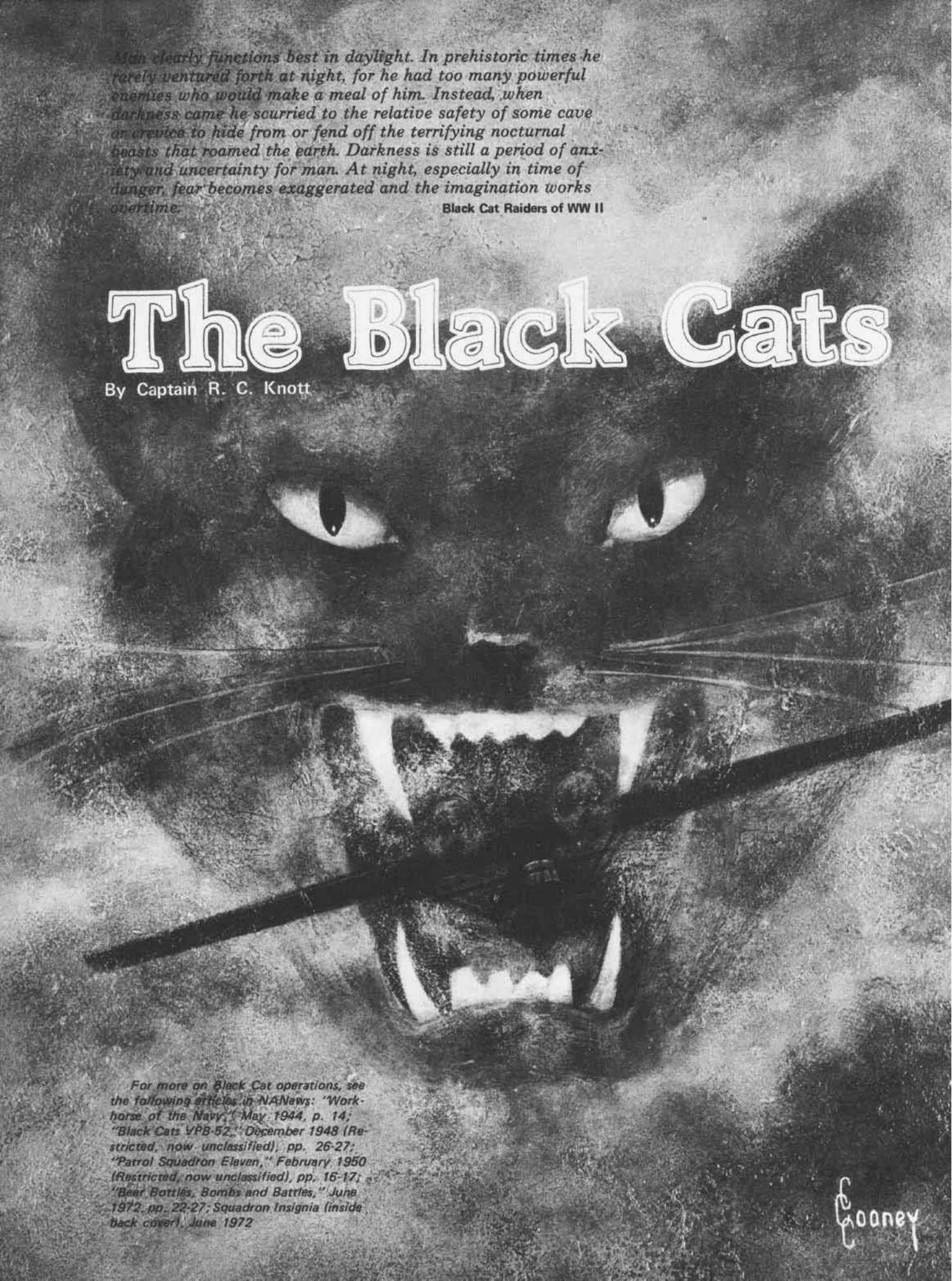
It is impossible to mention by name all the outstanding pilots, radar officers, enlisted aircrewmen, plane captains, ordnancemen and technicians who worked hard and risked their lives to make our efforts a significant part of winning the war. Nevertheless, we dedicate this article to them — they shall never be forgotten. ■

Man clearly functions best in daylight. In prehistoric times he rarely ventured forth at night, for he had too many powerful enemies who would make a meal of him. Instead, when darkness came he scurried to the relative safety of some cave or crevice to hide from or fend off the terrifying nocturnal beasts that roamed the earth. Darkness is still a period of anxiety and uncertainty for man. At night, especially in time of danger, fear becomes exaggerated and the imagination works overtime.

Black Cat Raiders of WW II

The Black Cats

By Captain R. C. Knott



For more on Black Cat operations, see the following articles in NANews: "Workhorse of the Navy," May 1944, p. 14; "Black Cats VPB-52," December 1948 (Restricted, now unclassified), pp. 26-27; "Patrol Squadron Eleven," February 1950 (Restricted, now unclassified), pp. 16-17; "Bear Bottles, Bombs and Battles," June 1972, pp. 22-27; Squadron Insignia (inside back cover), June 1972

Cooney

The *Black Cats* came into being as a matter of grim necessity. In the early days of WW II in the Pacific, the PBY Catalinas of Patrol Wing TEN were driven from the Philippines by overwhelming enemy forces. They were pushed southward to the Dutch East Indies and then to Australia. Striking back as best they could, their losses were high. The lumbering PBYs were no match for the fast maneuverable *Zeros* that controlled the air in the Southwest Pacific. By March 1942, only three PBYs of a total of 45 original and replacement aircraft of PATWING TEN had survived the enemy onslaught.

The Catalinas, or *Cats,* as they were called, were the only long-range patrol aircraft available in adequate numbers during the first years of the war. In the beginning, they were greatly maligned because of their vulnerability and their further usefulness as combat aircraft was seriously questioned. But with all their shortcomings in speed and maneuverability the PBYs were tough and dependable. They could take incredible beatings and still bring their crews home safely. And when airborne radar become available, they acquired a new and important advantage. They could see in the dark.

It was soon discovered that the *Cats,* slow, cumbersome and vulnerable by day, could be surefooted and deadly at night against enemy surface ships and shore installations. Innovative *Cat* crews of VP-11, one of the pioneer squadrons of *Black Cat* operations, experimented with mixtures of soap and lamp black to give their aircraft a coating that made them even more difficult to see against a night sky.

Three planes from this squadron made a daring night raid on Japanese ships gathered together at Tonelei Harbor, Bougainville, for the upcoming battle of the Santa Cruz Islands. Aircraft from VP-11, VP-24, VP-51, VP-91 and others did a superb job, locating enemy surface elements during this battle, and made night attacks on enemy warships including aircraft carriers. One *Catalina* from VP-91 put the destroyer *Teruzuki* out of action with a low-level attack.

Most enemy ships had no radar capability whatsoever to warn them of a *Cat's* approach. The big planes made initial detection with radar and homed in on the target until they spotted the telltale phosphorescent wakes that show up so clearly in tropical waters. The once formidable *Zeros* could do little to protect the surface vessels because they could no longer see their enemy. The *Cats* had no difficulty frustrating the efforts of fighters sent aloft to intercept them. They simply dove for the deck and disappeared against the black ocean backdrop.

The first official *Black Cat* squadron was VP-12 under Commander Clarence O. Taff. Its PBY-5A amphibians operating from Henderson Field on Guadalcanal scoured the New Georgia Sound known as "The Slot" in search of the "Tokyo Express" — Japanese warships and cargo vessels which came south at night to bombard U.S. positions and to supply their troops ashore.

The planes were painted flat black and equipped with radio altimeters which permitted them to skim low over the water for torpedo runs or to make low-level bombing attacks on enemy ships. *Black Cat* aircraft also made night harassing raids on enemy airfields and spotted for the heavy guns of U.S. surface combatants in night forays against the enemy. As the Japanese were pushed to the northwest along the Solomon Islands chain, the *Black Cats* of VP-12, VP-54, VP-81 and VP-44 played havoc with their seaborne supply lines.

VP-101 was the first to conduct *Black Cat* operations from New Guinea. They worked from the seaplane tender *San Pablo* at Namoia Bay and were followed by VP-11 and the tender *Half Moon.* By this time, VP-11 was on its second combat tour in the Pacific. Although the *Cats* had been tasked only with locating enemy surface ships and reporting their positions, this squadron, operating under Task Group Commander William Gallery, initiated daring night attacks on enemy vessels and transformed their mission into one of search and *attack.* In October 1943, a VP-11 *Cat* flown by Lieutenant Junior Grade L. M. Nelson engaged and sank the destroyer *Mochuzuki*.

VP-52 further refined the concept of low-level night attacks. Lieutenant W. J. Lahodney attacked and damaged a heavy cruiser in the Bismarck Sea for which he was awarded the Navy Cross. He also mounted four fixed 50-caliber machine guns in the nose of his aircraft for use in strafing attacks. This arrangement proved especially lethal against troop barges and other small vessels with which the Japanese attempted to supply their forces under cover of darkness.

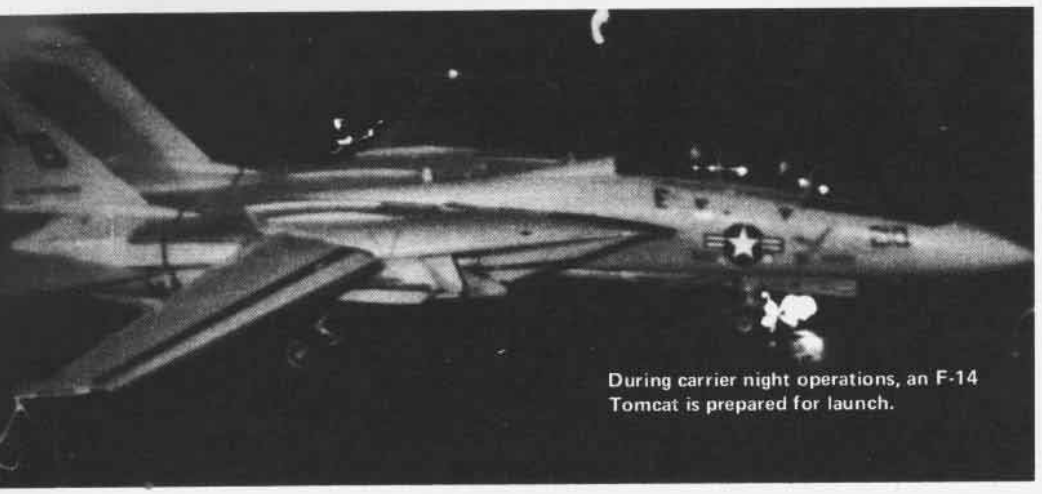
Lieutenant Bob Dilworth of VP-52 joined the enemy landing pattern at the large Japanese base at Wewak, New Guinea, one dark night. Before the startled enemy pilots knew what was happening, the PBY had sunk a ship off the end of the runway, strafed shore facilities and small craft, and disappeared into the darkness. Dilworth won the Silver Star for his audacity.

VP-52 was followed by VP-34 which sent a record number of ships to the bottom in the Bismarck Sea. In January 1944, several *Cats* from this squadron intercepted a convoy bound for the big enemy base at Rabaul and dispatched several large cargo vessels.

Black Cats also conducted numerous rescue missions, some under very hazardous conditions. One of the more spectacular of these was made off Kavieng, New Ireland, in February 1944. Lieutenant Nathan Gordon and his crew made several pickups of downed Army pilots and crewmen under intense enemy fire from the shores. Although the aircraft was heavily loaded and leaking badly, Gordon refused to leave until all the Americans shot down in his area had been rescued. He was later awarded the Congressional Medal of Honor for his actions.

In September 1944, VP-33 sank over 100,000 tons of enemy shipping in a little over one month of activity. No enemy vessel was safe from the aggressive *Cat* crews of this squadron. On one occasion, Lieutenant James Merritt flew so low in his attack on a cargo vessel that the aircraft struck one of the masts of the ship and brought home a piece of it imbedded in the leading edge of the wing. When VP-33 finally departed the Southwest Pacific for the United States, the squadron had been credited with 43 ships sunk, 20 damaged and over 100 smaller craft destroyed.

On October 1, 1944, VP squadrons were redesignated VPB to indicate their bombing capability. By this time, the PBYs were being rapidly replaced by faster, better armed patrol bombers like the PBM *Mariners,* and PV and PB4Y landplanes. VPB-54 and VPB-71 made some of the last PBY *Black Cat* attacks on enemy shipping in the Philippines and the South China Sea. ■



During carrier night operations, an F-14 Tomcat is prepared for launch.

Vision After Nightfall

Some things don't change. . .

This article first appeared in the January 1, 1944, issue of Naval Aviation News. It has been updated with very few alterations by the Naval Aerospace Medical Institute and the Naval Aerospace Research Laboratory, Pensacola, Fla.

Seeing at night is much different from seeing in the daytime, but it is difficult to convince pilots of this, flight instructors and aviation medical officers say. Too often, pilots assume that both day and night vision are simply a matter of seeing or not seeing. Also, the false idea persists that good day vision means good night vision.

Actually, night vision is quite different from day vision. Furthermore, it is imperative that pilots are aware of the limitations of their visual system under various light levels in order to maximize their detection and recognition abilities.

In explaining the problems of night vision, doctors point out that the retina of the eye is composed of 10 layers of cells. One of these layers contains the light receptors known as rods and cones. Under daylight conditions, the cone cells are functioning while the rod cells are relatively inactive. Vision mediated by cone cells is colored and exhibits high powers of discrimination of detail. When the available light is reduced, the rods after a period of dark adaptation become operative, mediating a colorless peripheral low-resolution type of vision. This dual-functioning system (rods and cones) provides for an operative range of vision under light levels a thousand times dimmer than that permitted by cone vision alone.

The area of the retina where cone cells are most heavily concentrated is termed the fobea. The fobea is the visual sensor of the eye and all objects that are sighted directly come to focus on this retinal location. It is therefore imperative that the pilot understand this fact and that under night conditions the fobea will be a "blind spot" that must be moved off the target to permit detection by the rod cells which are functioning in the peripheral retina.

The power of picking out detail is reduced at night because of the sparse distribution of nerve fibers serving the rods. Lines of shadow in a factory roof will often blend together from quite a low altitude, except sometimes when the contrast is increased by the lighted parts of the roof reflecting the moon. Roughly, the eye's power of resolving detail is five times less by the brightest moonlight than by day.

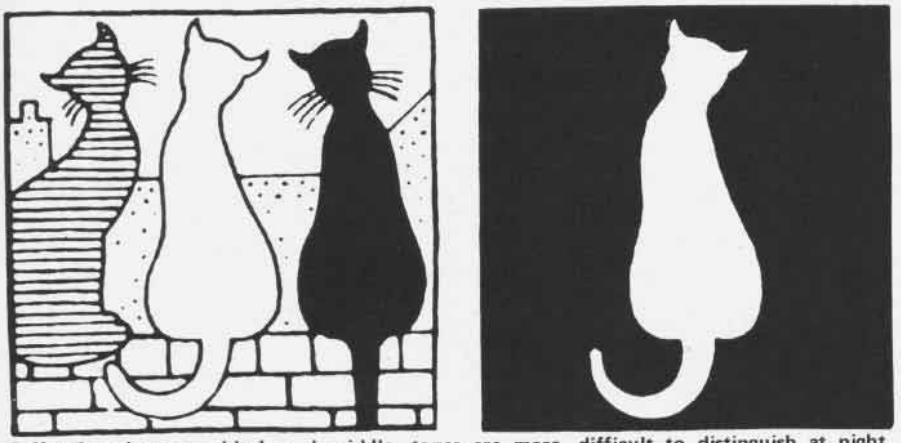
A great number of conditions of visibility may be encountered at night, depending on the phase and position of the moon and disposition of cloud and haze at different levels. Under usual conditions of darkness, dull colors fade to gray, bright red looks black, and blue looks pale gray. Ground features may look very different from time to time. Since recognition is made easier by familiarity, night crews are instructed to determine the direction from which the target and its surroundings will be lighted, before setting out to make observations.

As practice in judging the size of ground features, it is helpful, whenever objects of known size are seen, to note altitude so that a mental picture can be formed. It will then become easier to allow for haze variations.

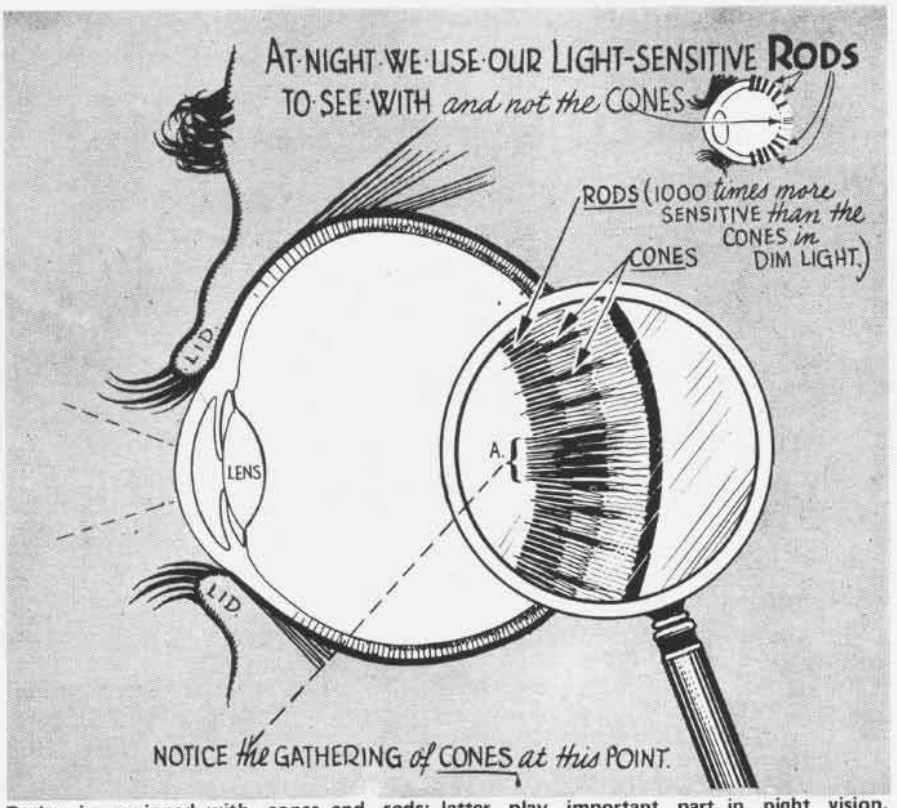
The size of an object is an important determining factor in night orientation. An airplane, clearly visible in plan, might be invisible when looked at from dead astern. The average aircraft is too small to be seen beyond 1,000 feet on a clear starry night unless it is seen in plan. When in pursuit of an enemy plane, the pilot should stay above or below where he can get a plan view, until he closes in.

TEN COMMANDMENTS OF NIGHT VISION

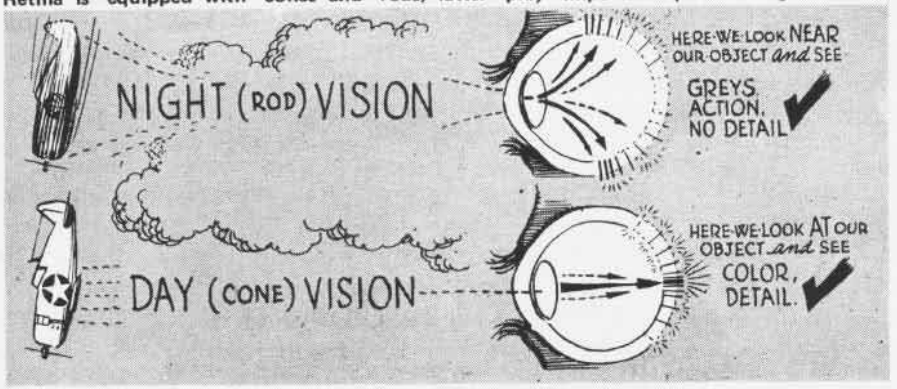
1. Do not attempt night duties until dark-adapted; avoid short cuts.
2. Maintain maximum dark adaptation by avoiding all possible light; practice blindfold drills until all surroundings are known by touch.
3. For instrument lighting use dim light, preferably red; do not stare longer than necessary at lighted instruments.
4. Keep windshield and goggles spotless and unscratched.
5. Practice using peripheral vision.
6. Move the eyes frequently; practice systematic scanning; be alert for moving objects.
7. Know the tactical value of low-light contrast in night missions.
8. Observe technical orders in use of oxygen; be overconscientious at night, not overconfident.
9. Don't break training — stakes are too high.
10. Maintain good diet, exercise and sufficient crew rest and curtail smoking.



Differences between black and middle tones are more difficult to distinguish at night.



Retina is equipped with cones and rods; latter play important part in night vision.



One of the primary hazards of night flying is sometimes experienced by wingmen whose only light source is the tail light of the lead plane—a single point of light against a formless, gray-black field of unlighted sea and sky. The wingman soon begins to experience strong *autokinetic movement* — technical term applied to the apparent movement of a light source that is actually fixed — in the light he is following.

Attempts to follow the "movements" of the light lead to closer fixation, setting up a fascination condition in which the pilot stares at the light to the exclusion of practically everything else. If fascination occurs, the wing pilot may spend an indefinite period at the controls in a dream-like condition ill-suited to the management of a modern airplane.

While proof of more than preliminary nature is still lacking, aviation medical officers feel the above conditions provide a reasonable explanation for certain hitherto "inexplicable" accidents. These accidents exhibit a common pattern in that the pilot is observed to break away from night formation, enter an all-out dive, and strike the water without any apparent attempt at recovery.

Pilots in training are warned that *autokinetic movement* is common and may be expected to occur in their night flying, possibly leading over into a fascination phase. Pilots should also be instructed that the simple avoidance of long periods of staring at the light ahead will help them to keep out of trouble.

Much publicity has been given to the relationship between diet, vitamins, and night vision. It is sufficient to say that use of large extra doses of vitamins — more than one would get in a liberal well-balanced diet — will not improve night vision above normal. The medical officer should be consulted for specific advice or further details on this subject.

Night vision is one of the first faculties affected adversely by failure to use oxygen at altitudes above 6,000 feet. In night flying, crews are strongly urged to use oxygen prior to reaching that altitude — to prevent night blindness and to preserve maximum vision and efficiency. ■

A typical common module infrared image of a ship underway is shown as seen by the aircrew operator.

Texas Instruments

A FLIR-equipped P-3 Orion undergoes testing with the new infrared imagery system.

Under the Cover of Darkness

By Commander Howard Wheeler

The scene is pitch black. There is virtually no light, not even the faint glow of starlight. The prey is crouched in a corner that is even darker than the surroundings. It has an uneasy sense of security, knowing that it can't be seen. If it can't be seen, surely it must be safe.

The hunter lurks nearby shrouded by the same blackness that envelops the entire area. It is as quiet as it is dark. Suddenly, there is a rush of movement as the hunter strikes at its target with lightning speed and deadly accuracy.

In this case, the hunter is a Southern Pacific rattlesnake and the prey is a small rodent. But the scenario is not unlike a combat situation. The survivor in one-on-one combat is almost always determined by which has the better ability to strike first, quickly and decisively before being detected.

During WW II, the odds were fairly even between Naval Aviators and enemy pilots. Night operations at sea were scary at best but there was some comfort in knowing that the enemy had to cope with the same limitations brought on by nightfall. Even though radar was introduced during the early 1940s, one of the best sensors a Naval Aviator had

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to locate a target at night while airborne was his eyes – the "mark one eyeball." (See "Black Chickens and Bat Teams," page 6.)

The human eye is primarily a daytime sensor, however, which is dependent on light reflected from the sun or other sources to perceive accurate images. It is extremely limited during the hours of darkness and in low-light situations, and virtually useless in total darkness.

If the rattlesnake in the scene described earlier had to rely solely on its eyes, it would have been hard pressed to locate its prey. The snake, however, is gifted with a remarkable ability to see through the darkness with thermal infrared (IR) sensors in the pits located in its head above the mouth. More accurately, it cannot see in the dark, but rather it can sense the location and apparent size of a warm-blooded animal without the aid of ambient light. Even though the snake's pit sensors do not provide it with a high-resolution image of the prey, they are highly effective.

Modern technology has enabled man to imitate and use many such capabilities found in nature. Several of today's naval aircraft, for instance, use infrared sensors to localize and identify targets – visually – over ranges suitable for targeting and attacks under completely lightless conditions.

Identifying a potential target as friend or foe – and, if foe, whether it is a high-value or low-value target – is a vital element of any combat mission. For a pilot to be able to confirm the identity of the target without giving away his own position before attack may mean the difference between success and failure.

High technology is the edge today's Naval Aviators have to strike quickly and accurately at their prey. The state-of-the-art of infrared sensors technology is impressive and has significantly enhanced mission success. However, it is in a class by itself in terms of the time and expense involved in manufacturing current infrared detectors.

Let's take a look at one system being used in the fleet today.

The current Navy AN/AAS-36 infrared detecting set (IRDS) is in the category of sensors called forward-looking infrared (FLIR) systems, used to examine the earth's surface

by detecting different intensities of infrared energy radiated by specific objects or ground formations. The IRDS is used to detect objects on or just below the surface of the sea, or along the flight path of the P-3 *Orion* aircraft.

According to Mr. W. Theodore Noel, an electrical engineer involved with infrared technology at the Naval Air Systems Command, Washington, D.C., the thermal infrared sensor used in the AN/AAS-36 IRDS is a complex device consisting of a 180-element, semiconductor chip measuring about an inch long and mounted in a vacuum enclosure with an optical entrance window through which the detector can view an infrared scene. Some 24 weeks of manufacturing time under the most stringent environmentally-controlled conditions are required to produce a chip that meets Navy performance requirements. The thermal infrared sensitive semiconductor chip, for example, is manufactured from an exotic mixture of three metals — mercury, cadmium and telluride. The fabrication process for these substances alone requires approximately three months and involves an array of semiconductor operations that include photolithography, thin and thick film technology, metal etching, diffusion, plasma etch, and high vacuum technology. If during this lengthy and elaborate production process a detector fails to meet standards, it cannot be salvaged or reused.

While the eye of the pilot needs visible light and radar depends on microwave energy to locate targets, the IRDS depends solely on the man-made or natural thermal heat energy emitted by an object in the infrared spectrum.

To a physicist, visible and thermal infrared radiation can be measured in terms of their respective wavelengths. For example, the wavelength of ultraviolet light (the invisible part of sunlight that causes sunburn) is approximately .2 to .4 microns. Visible light which the eye perceives as colors has wavelengths of between .4 to .75 microns. Slightly higher on the electromagnetic spectrum is thermal infrared energy with wavelengths between 8 and 14 microns.

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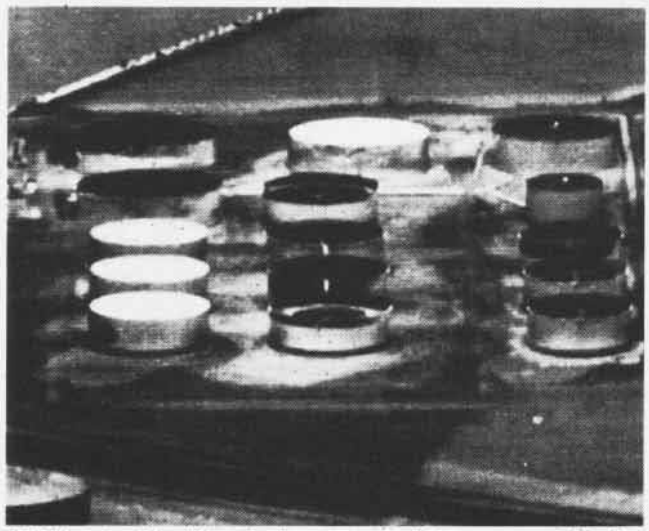
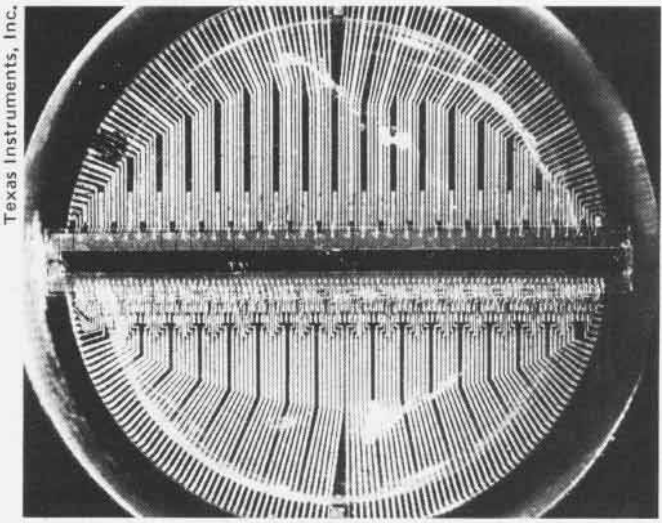


A TV image of fuel farm is shown on a typical common module infrared image device.

Texas Instruments, Inc.



The heart of the infrared detection system (IRDS) is this one-inch diameter, 180-element infrared detector. It senses thermal infrared energy given off by a target and its surroundings, and changes it into electrical signals which are used to create a high-resolution TV image. The imagery provided by the video display is used by the operator to locate and classify the target.

The IRDS is a passive thermal imaging device that detects infrared radiation in the 8 to 14-micron spectral region. Since the earth's natural emissions occur in this range, the earth as "seen" by the IRDS provides a consistent background against which all objects show in relief by virtue of their normally higher or lower intensities of infrared emissions. Even an object cooler in infrared terms than the earth's surface will be "visible" to the IRDS because the system will detect this against the background.

Since IR emissions are always present, the IRDS can detect objects in spite of the presence of haze, smoke, camouflage or darkness. However, it does have some limitations because moisture in the air (clouds, rain, fog) tends to absorb and scatter IR energy. Its presence in the atmosphere can somewhat degrade the system's range.

Unlike radar and active sonar-detecting devices that can be located by the presence of their emissions, the IRDS is a totally passive scanning receiver/sensor that emits no energy. Therefore, it is difficult for the target to detect that it is the subject of surveillance by the IRDS. Also, since the IRDS is entirely passive, there is no effective way to jam the system with countermeasures.

The IRDS can detect targets such as surface ships and temperature anomalies that are caused by ship bulkheads, heated and cooled ship compartments, and snorkel wakes. The system converts these variations in IR energy intensities to an electrical signal that is displayed on a television-type display. The operator viewing the video display can then detect and identify targets from an ample standoff range.

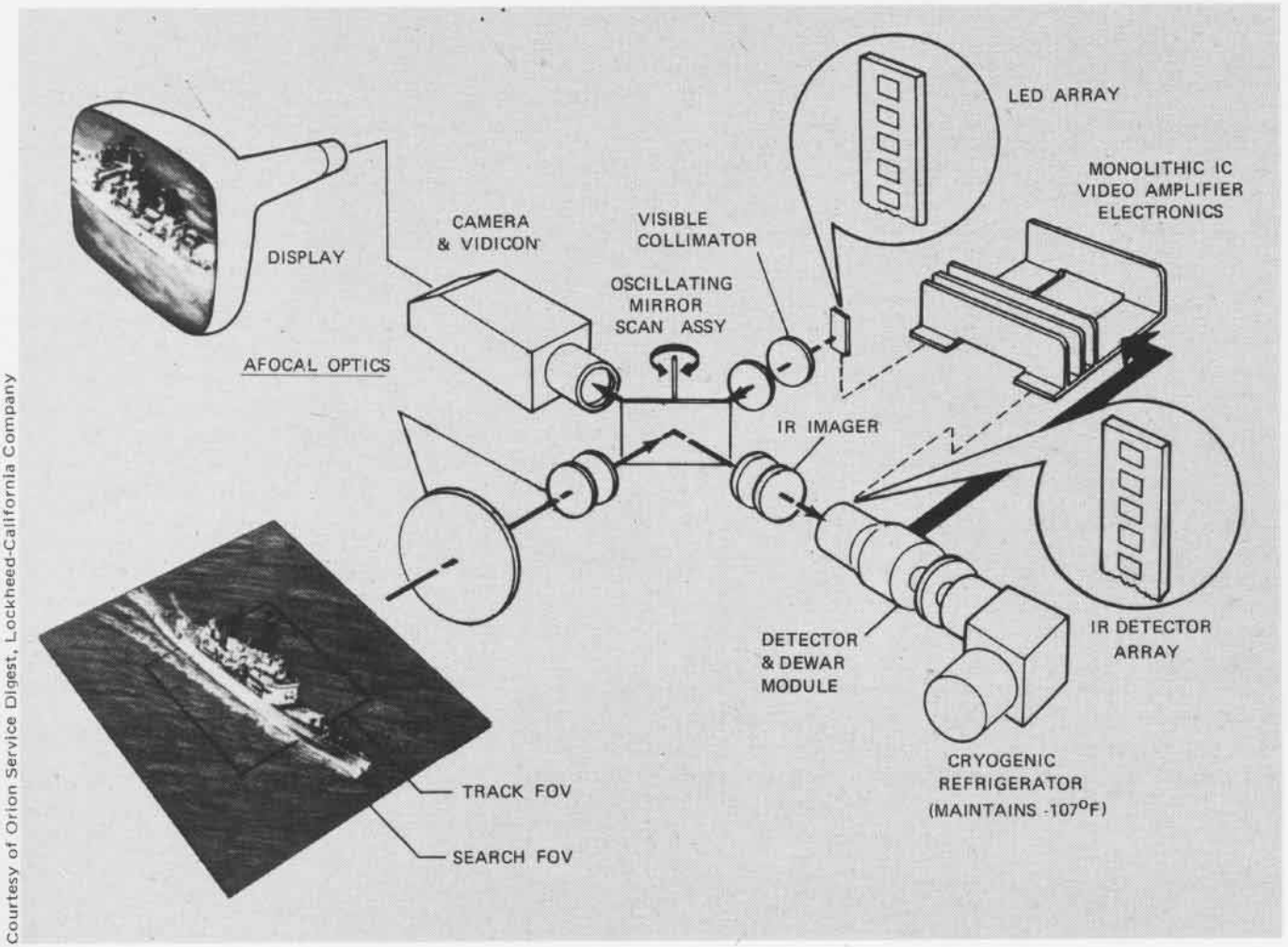
Compared to yesteryear, today's Naval Aviators and flight crews have the benefit of highly reliable and effective detection systems such as IRDS to enhance mission readiness and enable them to strike first when going in harm's way. ■

IRDS Receiver Operation

The infrared receiver detection system (IRDS) is basically a high-performance infrared (IR) television. It senses IR heat energy emitted by an object, and converts it first to an electrical signal and then to visible light which is received by a TV camera.

The infrared radiation from the target scene is collected by afocal telescopic optics and focused onto one side of an oscillating, double-faced scan mirror. From the mirror, the IR energy is reflected onto an array of IR detectors that operate at -196°C (-107°F). The detector array converts the IR energy to an electrical signal that is processed and amplified. The amplified signal then modulates the light intensity from an array of light-emitting diodes (LEDs) where it is converted to a visual image. The back side of the scan mirror projects the image from the LED array onto the face of the camera/vidicon. The visible image is converted to a video signal which is amplified and then converted into a standard composite TV video signal that provides an 875-line display on the IRDS video indicator.

The IRDS system in the P-3 *Orion* can provide full lower hemispheric coverage. The system's line of sight rotates a full 200 degrees both left and right of the aircraft's centerline and swivels 15 degrees up and 82 degrees down in elevation. The IRDS has two fields of view (FOV): a wide FOV (search) for initial acquisition, and a narrow FOV (track) for identification and classification of a target. ■



Courtesy of Orion Service Digest, Lockheed-California Company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The author gratefully acknowledges that portions of this material, including Mr. Heinemann's personal anecdotes, were taken from Ed Heinemann, Combat Aircraft Designer, co-authored by Edward H. Heinemann and Capt. Rosario Rausa, Naval Institute Press.

A TALE OF A WHALE

by Lieutenant Commander Roger P. Jacobs, USNR

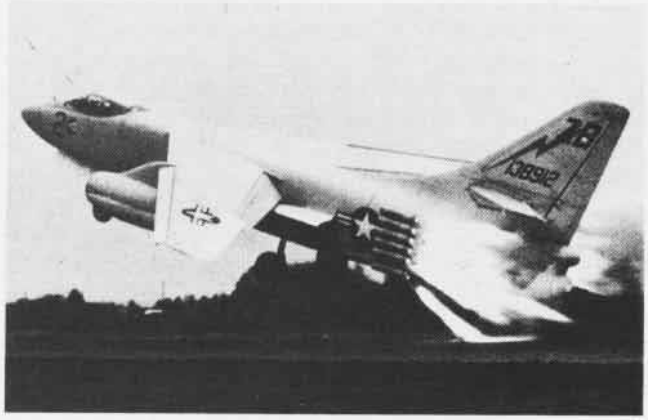
The A-3 Skywarrior is a fascinating carrier-based aircraft that has been serving the needs of the Navy for more than 30 years. It is affectionately known as the Whale by those who fly and support it. This is the story of how it came to be.

When the atom bomb destroyed two Japanese cities in 1945, it helped to bring about an earlier end to WW II. It also confronted military men with a weapon previously unknown in warfare, a weapon that was to change the face of war. The extent of destruction, thereafter, was measured in kilotons and the scope of weapons delivery became intercontinental. Powerful beyond imagination, the new bombs were also incredibly bulky and their delivery systems even more so.

The lumbering B-29s had done their jobs well enough, but faster aircraft using the then rapidly developing jet technology soon became an important military priority. Four years of global strife, however, had left America financially weary. Military units were disbanded, entire fleets mothballed, and aircraft by the thousands cut up for scrap as the nation stood down from war. As the budgetary pie grew smaller, the military services competed to maintain meaningful strength in a newly dawning era, the Cold War, during which nuclear weapons would become a key element.

The Army was doing some promising work with guided missiles. The newly-formed Air Force enjoyed a relatively secure position since its bombers were the only proven atomic weapons delivery vehicles. The Navy, meanwhile, advocated a multifaceted approach – a combination of land, sea and air-based employment of atomic weapons. This was known as the *Triad Concept* and eventually became the basic philosophy of America's nuclear defense.

In essence the Navy's idea was quite logical but not immediately employable since a sea-going delivery system did not exist in the late 1940s. On Constitution Avenue, however, there were some ambitious plans afoot. The Bureau of Ships was reviewing the blueprints of a new "super carrier," a 1,000-foot behemoth to be christened USS *United States*. She was designed to weigh an unprecedented 65,000 tons and ultimately replace older carriers of the *Midway* and *Essex* class.



With JATO bottles attached, an A3D takes to the air on a tail of flame. The 35-ton aircraft, with 54,000 extra pounds of thrust provided by JATO rockets, could take off in four seconds from the release of the brakes in less than the length of a football field. Though never attempted, it was calculated that with the JATO assist, the Skywarrior could deck launch without use of the carrier catapult.

Less well defined but equally critical to the Navy, was the aircraft that would operate from this vessel and be capable of delivering a nuclear weapon to an enemy target. A new research company called the Rand Corporation had dug into the problem and established some general requirements. A jet bomber was needed that could carry a 10,000-

pound bomb over a range of about 2,000 miles. These were eye-popping figures as jet aircraft themselves were something of a novelty, and the Rand estimates were far beyond the capabilities of carrier aircraft of the day. The real problem, though, was one of sheer size and the Rand report had predicted such a machine would weigh "well in excess of 100,000 pounds." Numbers like that were intimidating, and few believed that kind of monster would ever put to sea on a flight deck. Still, the Navy was confident that the proposed "Class 6A" super carrier could handle the job. In essence, the Navy was betting on it.

Actually, no one really knew what such an aircraft would weigh or even if the idea was feasible. Engineers from BuAer, now known as the Naval Air Systems Command, were given the broadest latitude to determine the project's feasibility. They were told to consider any weight between 62,000 and 200,000 pounds. And, if the "constraints" imposed were excessive, they were to pursue more exotic ideas, including a "landing-gearless aircraft" that would be ditched at sea at the end of the mission. Clearly, the Navy was serious about it and committed to having a bomber capable of delivering nuclear weapons from a sea-based platform.

Confirming the worst, BuAer advised the Chief of Naval Operations in May 1948 that it apparently could not be done. A turboprop aircraft had a range possibility, the chief of design research concluded, provided room could be found somewhere on the flight deck for 130,000-pounds of aluminum.

An RA-3B Skywarrior at the Military Aircraft Storage and Disposition Center in Tucson, Ariz., undergoes preparation for a flight to the Naval Air Rework Facility in Alameda, where it will be converted to an electronic reconnaissance (ERA-3B) configuration.

On Capitol Hill, meanwhile, debate was building to cancel the new carrier that many considered far too expensive. A sea-going nuclear capability would help justify the new ship and so, with fingers crossed, the Navy approached the aircraft industry with an idea of what it needed. In August 1948 the Navy asked for competitive bids from 14 manufacturers for a naval jet bomber with a gross weight of approximately 100,000 pounds suggested as a starting figure. Eight of the companies never replied, apparently because it appeared to be a waste of time and money on what seemed to be a hopeless case. By early 1949, there were only two serious bidders, the Curtiss-Wright and Douglas Aircraft companies. Ever hopeful, BuAer proposed that the DR-64 aircraft, as the project was then officially known, should be in the air by October 1952.

Ed Heinemann, chief engineer and father to a long and successful line of Navy airplanes, headed up Douglas' military design team at its El Segundo, Calif., plant. The tall, unassuming son of a furniture salesman, Heinemann had a proven reputation for building solid, no-nonsense airplanes for the Navy. Having just turned 40, he could already look back on over 20 years of aircraft design experience. When Heinemann talked, people at BuAer listened!

Still, the days of one-man aircraft design were long past and Heinemann had wisely surrounded himself with a lean but talented staff of experienced engineers. The gutsy A-1 *Skyraider* was their recent creation, and they were just now putting the finishing touches on an exciting new tailless fighter, the F4D *Skyray*.

The technological difficulties confronting Heinemann and his staff were bad enough, but the ironclad secrecy surrounding nuclear weapons in those days was nothing short of exasperating. Their job was to design a nuclear delivery bomber, but they had no idea what the bomb looked like, and no one was about to tell them. In reality, the shapes of the special weapons were highly variable, ranging from long and thin to short and fat, and some had unusual projections and tail assemblies.

To cover all possibilities, BuAer took a one-size-fits-all approach and challenged the two competing firms to design an airplane around a nondescript 5'x5'x15' box, into which a mysterious 10,000-pound "special weapon" would be loaded. That was fine, the designers thought, but could a wing spar pass through the top of the box or could a fuel line run along the side? Such deviations would be reviewed on a case-by-case basis by a team of Navy engineers, which either approved or denied the idea, but rarely said why.

The Douglas Company proposed a 45,000-pound aircraft that seemingly met all specifications — a virtual featherweight. It was reasoned that a single-purpose aircraft could carry an aerodynamic shape in a conformal recess under the fuselage, thereby saving a lot of space and weight. They were told, however, that an enclosed bomb bay was essential as "certain mechanical operations" would be performed by the crew en route to the target.

Heinemann, meanwhile, was sensing doubt about the highly-touted new super carrier. He had spent enough time in Washington to detect the nuances of shifting political feelings and he did not believe USS *United States* would

The 20mm radar-guided cannon in an A-3 tail are checked prior to flight. Heinemann considered it excess weight, but the Navy insisted on the weapon for tail defense. The cannon was eventually removed by the early 1960s.

sail unscathed past her powerful detractors. As it was assumed that the new bomber would be too heavy for any existing ships, the implications for the DR-64 project were obvious. Could the airplane be slimmed down to the 68,000-pound deck limitation of the *Midway* class? Heinemann thought so, but he knew it would put the Douglas entry on thin ice. It wasn't exactly what the Navy wanted, but he felt that events in Washington would force the issue his way. At his direction, the El Segundo plant shifted gears, anticipating that it would be a smaller airplane or nothing at all.

Before going too far out on a limb, Douglas wanted an unofficial indication that this new idea was at least marginally acceptable to BuAer. Armed with a roll of preliminary drawings Heinemann called at the office of Captain Joseph Murphy, BuAer's officer in charge of the aircraft division. "Murph," as he was called, was well known as a straight shooter and his candid assessment would be most valuable. After the usual pleasantries, the two unrolled the plans and Capt. Murphy began his examination while Heinemann stood by. As the pages were flipped and the figures checked, Capt. Murphy first became uneasy and then fell silent. Then shaking his head he expressed his somewhat strong negative feelings about the proposal. He obviously was not impressed.

Heinemann became upset, gathered up the drawings and started to leave. The Douglas design was literally headed right out the door. But Murphy, hoping that the situation could be saved, stopped Heinemann at the door. He suggested that Heinemann leave the blueprints and that he have his staff at least "check 'em over." Heinemann paused, uncertain as to what he would do. After a few moments of thought, he put the plans on the table and left.

Weeks later, the El Segundo group would learn in a roundabout way that BuAer had indeed scrutinized the 68,000-pound design and found it at least worthy of further consideration. This was no surprise to the folks in El Segundo. But a greater reward and professional satisfaction were in store. In early 1949, the Secretary of the Navy announced that USS *United States*, her keel already laid, was being scrapped. (A few years later, after the Korean War once again demonstrated the value of the large, attack aircraft carrier, the super carrier project was reborn as the USS *Forrestal*.) As Heinemann had foreseen, the Douglas Aircraft Company now had the only naval bomber design even remotely feasible. The El Segundo division rolled up its sleeves for the heavy work ahead on the newly designated XA3D-1.

The Douglas design, which was nothing less than the world's largest and heaviest carrier-based aircraft, would not be without problems. It was soon evident that the Achilles heel of the project would be the wing.

In the yank-and-bank world of tactical aviation, aircraft can scarcely afford the luxury of graceful, low drag airfoils enjoyed by their distant cousins in the transport business. Yet here was an airplane that needed just such a high "aspect ratio" to satisfy its long-range attack mission, but still survive in the catapult-arresting-gear world of shipboard landings, and low-altitude loft bombing.

Thus the A3D became the object of the most thorough wing life studies (which continue to this day) of any Navy flying machine. Aerodynamicists wanted a long, lean wing for the intercontinental range the Navy needed so badly. But structural engineers pointed out the beating that such a design would take during the stresses associated with arrested landings. After some "prodigious number crunching," a compromise was finally reached: a 6.75 span-to-chord ratio, quite high for carrier aircraft. The next controversy shifted to the placement of the J40 engines, which obviously could not be fuselage-mounted without violating the outlandish size requirements for the bomb bay. So the question revolved around where and how wing nacelles would be mounted. Wind tunnel tests showed that an engine imbedded in the wing, similar to some British designs, produced the least drag. But a low-slung, pod-mounted engine would be infinitely easier to maintain in the real world of cyclic flight operations. It would also allow a simple, continuous landing flap with attendant weight and maintenance economies. But the decision to employ the simpler under-wing nacelle rested, once again, on an educated hunch.

Even back then, the Navy wanted more commonality among its aircraft. Westinghouse had built hundreds of reliable engines since the war and its new J40 was being groomed as the future "standard" for Navy jets. It would power the F4D *Skyray* and F3H *Demon* among others. But the engine had some unsettling problems, including questionable reliability. Early J40s were often "pulled" for maintenance after less than 30 hours' service. Westinghouse

An A-3B from VAH-8 releases a bomb on a run over North Vietnam in late 1965. In the mid-1960s, A-3s were often used in carrier air strikes against northern targets. The air wing also found the aircraft's inflight refueling capability useful.

was busy on some fixes, but obviously had a long way to go. If the XA3D powerplant had to be changed in mid-production, a pod-mounted, under-wing design would require only minor changes. Anxious to preserve his options, Heinemann ordered the pod design.

The project began nicely and the classic lines of a great airplane were taking shape on scores of drafting tables around the Douglas plant. It would have been easy to assume that the worst was over with nothing left but relatively mundane details.

A computer analysis of the bomber's flight dynamics showed that unacceptable wing flutter would occur well below the airplane's maximum speed. Disturbingly, the problem seemed inherent in the wing's lean design and no reasonable amount of engineering legerdemain would completely fix it. The wing skin was beefed up and the nacelles were shifted around and given extra bracing. The computer, however, kept churning out bad news about the wing's basic stability. But could the numbers be trusted? After all, computer simulation was not well refined in 1950. Wind tunnel tests to confirm the problem were under way but not yet complete, and time was getting short. This was a high priority project and no one wanted to see production slip.

When the wind tunnel tests were finally complete, the results were unequivocal. They were also horrific. The warping and twisting motions suggested by the computer were actually worse. "This," noted a Douglas engineer of philosophic outlook, "was a disquieting event." Not much could be done about it though. Down on the shop floor, metal was already being cut, so the plane's designers reluctantly began to assess the inevitable flight restrictions that would apply. It was not exactly a cheery prospect, and they could hear the "I told you so's" all the way back to NavAir's "W" Building.

Worse still, it was increasingly obvious that the J40 engine wasn't going to measure up. The El Segundo group took a belated look at possible replacement engines, particularly an experimental Pratt and Whitney product, the J57.

Aircraft design is a precise, calculated endeavor leaving little room for late changes, yet the new engines seemed to work like magic. Wind tunnel tests showed that the heftier J57 had a dampening effect on the twisting and bending movements of the wing. The mood around the plant grew cautiously optimistic. It was about time, too. Production had commenced and by then real airplanes were taking shape down in the hangar.

A noteworthy but overlooked feature of the A3D's

Ed Heinemann

Hornet during testing of the Navy's and Marine Corps' new fighter/attack jet.

maiden flight was the date when it took place – almost on the exact date specified by BuAer three-and-a-half years earlier. On October 28, 1952, veteran Douglas test pilot George Jansen took the gleaming jet aloft for a short flight over the Southern California countryside and the public got its first glimpse of the new bomber. The first few flights confirmed that the J40 was woefully inadequate, and every subsequent A3D was powered by a pair of Pratt and Whitney engines. The wing and engines did seem to bounce around a bit but it was passable.

Production and flight testing lagged somewhat as the new engines were slipped into the assembly line, and fleet introduction was delayed until early 1956. The subsonic A3D was not remarkably fast but, as advertised, it went a long way on a tank of gas. Somewhere along the way, no doubt due to its size, the tailhook Navy's newest member was dubbed the *Whale*.

With its great fuselage volume, it was perhaps inevitable that the A3's internal organs would be rearranged to accommodate other missions. As soon as the *Skywarrior* hit the fleet, Douglas began working on variations of the bomber, some at the Navy's request, others on its own initiative. Someone would come up with an innovative idea, make a few phone calls down to the shop floor and there would appear a new version of the *Whale* rolling out of the hangar. In any event, weapons' procurement was much simpler then, compared to the present procurement process.

The *Skywarrior* went on to become an improved bomber (A-3B); a radar trainer (TA-3B); an electronic reconnaissance platform (EA-3B); a tanker (KA-3B); a tanker-electronic jammer (EKA-3B); a photoreconnaissance platform (RA-3B); a dedicated electronics jammer (ERA-3B); an airborne weapons test bed (NRA-3B); and a VIP transport (the so-called VA-3B). Fifty of these venerable workhorses remain in service around the world and, with plans to stand up a new squadron next year, the number of active airframes is growing.

Just how long will the *Whale* remain in the inventory? That's hard to say, but there aren't any retirement parties planned for the foreseeable future. Under a Navy contract, the LTV Corporation recently took the "oldest" A-3, a wizened TA-3B with over 12,000 hours' service. It will stress the wings and the catapult and arresting component out to 20,000 hours in an extended fatigue study. The tests are still in progress but, from a strictly engineering standpoint, the *Whale* is expected to be flying in the mid-1990s.

None of this was planned in 1948. Ed Heinemann and his crew at Douglas simply gave the Navy the most dependable, straight-forward aircraft that the technology of the day would allow, and 30 years of flying is solid proof of his precepts. And it seems dirt cheap at under $2 million per copy, though that was no doubt a princely sum at the time.

The architect of some 20 different aircraft, Ed Heinemann usually dodges the inevitable question: "Which one was your favorite?" After all, that's like asking a mother which of her children she likes best. But years after he had sheathed his slide rule for the last time, he waxed nostalgic when his biographer posed that same question. Certainly the A-1 *Skyraider* was a favorite. And, of course, the A-4 *Skyhawk* (*Heinemann's Hotrod*), the most successful in terms of number produced. But finally he confessed, "I am most proud of . . . the A3D, because it presented us with the biggest challenge. To hone its weight down from 100,000 pounds to 68,000 pounds for carrier operations was a significant feat. We proved the skeptics wrong on that one."

His final accolade is surely the most timeless. "I believe the taxpayers got their money's worth."■

SKYWARRIOR

by Harold Andrews

Every week, Vice Admiral E.R. Seymour, ComNavAirSysCom, and his assistant commanders review two of NavAir's principal programs with the project managers. For the most part these programs cover such major current systems as the F/A-18, *Harpoon*, LAMPS MK III, etc. In August, one of the systems given this attention had a record of more than 30 years of BuAer/BuWeps/NavAir attention; it was the Douglas A-3 *Skywarrior*.

Originally contracted for in 1949 as the XA3D-1, the A3D received maximum attention over the next decade. It was to be the Navy's carrier-based, long-range bomber, capable of delivering a nuclear weapon on targets far inland from its base at sea. When the A3D entered the fleet as one of the new "Sexy Six" in 1956, its design had already been adapted to a number of other purposes: the -2P, -2Q and -2T for photographic, ECM and training missions, respectively. As the *Polaris* submarines took over the Navy's portion of the strategic nuclear mission, these versions and others to come became the main thrust of the *Skywarrior* in carrier operations.

Redesignated in the early sixties to the A-3 series, the existing versions of the A-3B (now RA, EA and TA) were joined by the widely used KA tankers and ERA and EKA multipurpose versions, as well as one VA for special mission support. In these roles, the "Whales" supported the Southeast Asia combat action of the next decade, as well as serving Navy mission needs elsewhere in the world.

Once scheduled for phaseout in the mid-seventies, the *Skywarrior* outlasted the planners. Today, the main thing clear about its future is that the end of its life cannot be predicted with any certainty. Most of the remaining A-3s have already flown for more hours than originally planned. Structural tests are now under way to determine the extent of airframe life that can be safely expected.

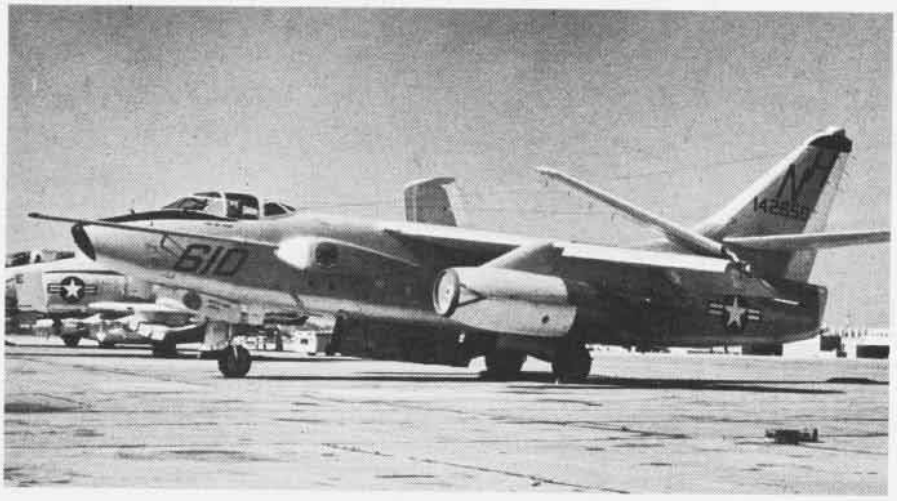
With additional airframes withdrawn from the desert (see "Please Don't Call It a Boneyard," this issue), only now being modified into ERA configuration, the fleet of some 50 "Whales" will continue their specialized roles in support of overall Navy missions well into the future.

An A3D from VAH-4 prepares for landing aboard the carrier Hancock in 1957.

In flight off San Diego during fleet exercise Varsity Knight, an ERA-3B Skywarrior from VAQ-33 performs the role of electronic reconnaissance.

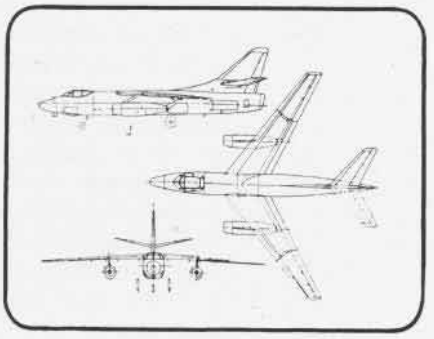
Bob Lawson

Bob Lawson

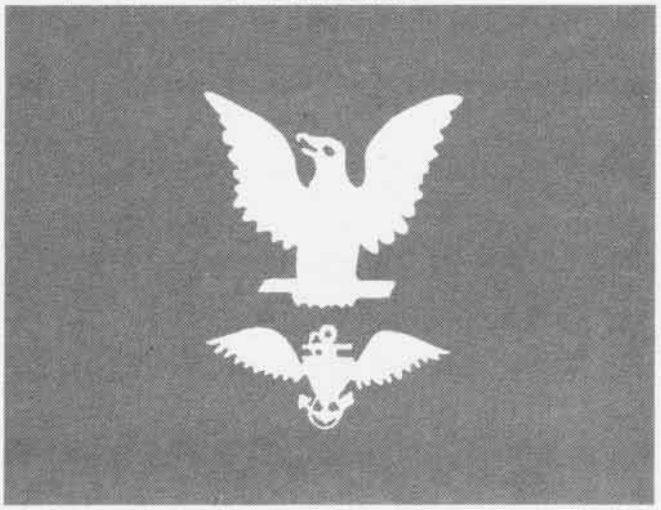


An EKA-3B version of the Whale attached to VAQ-135 sits at the end of a flight line at NAS North Island in early 1972.

Length		
A-3A		74'5"
A-3B		74'9"
EA-3B		76'5"
Height		22'8"
Wing span		72'6"
Powerplant		
A-3A	P&W	J57-P-6
A-3B	P&W	J57-P-10
Maximum speed		
A-3A		540 kts
A-3B		558 kts
Service ceiling		
A-3A		39,000'
A-3B		39,100'
Combat radius		
A-3A		1,000 nm
A-3B		1,200 nm
Armament		
A-3A		8,700 lbs. of bombs, nuclear weapons; two nuclear weapons; two 20mms in tail
A-3B		12,800 lbs. of bombs, mines and nuclear weapons; two 20mms in tail



The Naval Aviation Pilot insignia became history with the retirement of Capt. "Jack" Emerson on September 1, 1982. NANews' March 1981 issue reported the January 1, 1981, retirement of MCPO R. K. Jones, the last NAP to leave active duty as an enlisted member.



The Last of the

By Sandy Russell

The land of opportunity lies somewhere between a log house in Canada and a career as a U.S. Navy pilot. That's the truth according to Captain J. R. "Jack" Emerson, who is living proof that opportunity abounds in the Navy if one is willing to take advantage of it. He believes, however, that opportunity doesn't necessarily knock on the door. One must pursue it. Although some doors were slammed in his face along the way, he never lost sight of his goal — to fly naval aircraft.

With his retirement on September 1, 1982, Capt. Emerson brought to a close 40 years of continuous naval service, marking the end of a special breed of Navy flyers — Naval Aviation Pilots (NAPs). The Navy trained some 3,700 enlisted men as NAPs from 1916 to 1947. The ranks of these enlisted pilots have waned, but their service and dedication are hallmarks in the history of Naval Aviation.

Though the NAPs are gone now, today's answer to the program is very much alive. The Aviation Limited Duty Officer (LDO) program was established in 1980 (see *NANews*, April 1982) as one of the Navy's initiatives to reduce

While a student NAP at NAS Memphis, Emerson posed with his trusty Stearman in March 1946.

Ens. Emerson (front row, second from left) was the most junior officer at VP-4 but fifth senior in flight time. C.O. Cdr. L. D. Davis (front row, center), also an ex-NAP, was one of the few warrant officer pilots in the Navy at the outset of WW II.

NAPs

pilot shortages and enhance pilot training, while offering top Navy enlisted members an opportunity to fly naval aircraft and earn a commission at the same time. The latter aspect is unlike the NAP program in which most of the graduates retained their enlisted status after flight training. Capt. Emerson was one of the exceptions and, until his retirement, he was *the last* ex-Naval Aviation Pilot on active duty.

With high expectations for the LDO aviator program when it began, Capt. Emerson hoped it would get off to a better start. Out of the 34 applicants for the second class of candidates, only 16 were selected instead of the planned 30. He is grateful that quality was not sacrificed in order to meet quotas. His advice to a potential candidate is to get started on the correspondence courses to prepare for a commission and let his "basic smarts" take him through the flight program. He says, "Today, it isn't enough that you simply want to fly an airplane, you have to be a naval officer, too. Being a naval officer and competing against others to become one is probably the most difficult part of the program." He goes on, "It's a marvelous opportunity for enlisted men and women to learn to fly state-of-the-art aircraft and employ such skills in advancing their personal growth."

Summing up, Capt. Emerson states, "I would have jumped at the chance to become an LDO aviator after flight training." He says that after WW II if an Aviation Pilot became a warrant officer he was not allowed to fly, and there was no means yet established for an enlisted pilot to reach commissioned status. Before WW II, the Navy had a few warrant officers who were pilots, such as Patrick J. "Pappy" Byrne, known for his pioneering work with seaplanes.

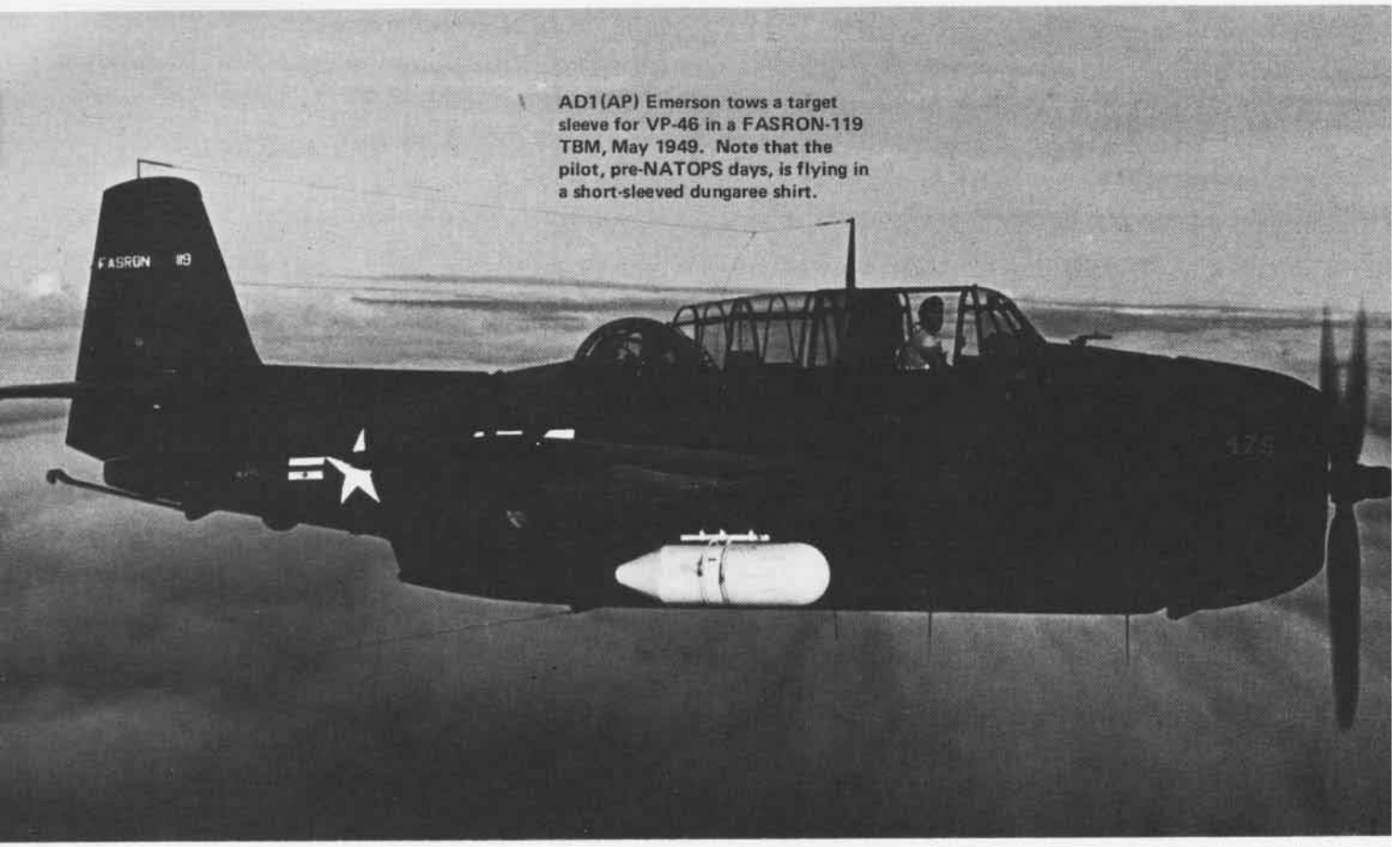
"I would have jumped at the chance to become an LDO Aviator. . ."

Capt. Emerson can certainly serve as an inspiration to today's enlisted members who are interested in flying and moving up in the aviation ranks. He is a perfect example of how ambition and determination can pay off. From his childhood in what he calls a "pretty basic existence" in a log house, Emerson followed his dream, built a successful career and fulfilling life.

Born 60 years ago in Busby, a crossroads in the central part of Alberta, Canada, he and his family eventually moved to Oakland, Calif., where he graduated from high school in 1940. He became a U.S. citizen in December of that year.

As a youngster in the 1930s, he became interested in aviation and built over 300 models. From his gas-powered, free-flight models, he says he learned a lot about what it takes to make an airplane fly. So when WW II came along, Emerson wanted to fly "in the worst way" for the Navy particularly because he had grown up near what is now NAS Alameda. Unable to get into the Naval Aviation Cadet program, which required 10 years of U.S. citizenship and a college degree to earn a commission in the Naval Reserve, he learned about Naval Aviation Pilot training and signed up in the regular Navy with the intent of applying for the enlisted pilot program.

Much to his disappointment, however, events took another turn. After boot camp, none of his company went into aviation and he was scheduled to go to machinist's mate school. He says,



AD1(AP) Emerson tows a target sleeve for VP-46 in a FASRON-119 TBM, May 1949. Note that the pilot, pre-NATOPS days, is flying in a short-sleeved dungaree shirt.

"I could just see myself in the bowels of some ship grinding valves or something." As it turned out, though, he never made it to the school. He developed a case of mumps and spent the next five weeks in a hospital. While there, he was able to make arrangements to obtain orders to aviation machinist's mate school. Next, he attended schools for airborne radar operators and gunners. After a brief period as an instructor at the gunnery school, he went to the Southwest Pacific.

In March 1944, Emerson applied for Aviation Pilot training and was placed on a waiting list. Meanwhile, he was offered a temporary officer's commission, a common practice during the war. He decided to turn it down because he had joined the Navy for one reason — to fly airplanes. He knew if he took the commission there was a chance that after the war he would revert to his rate of Aviation Machinist's Mate First Class, still with no flight training. In December, he finally got orders to flight school and headed back home for 30 days of leave.

". . .let me tell you my sad story."

Emerson had gone from apprentice seaman to first class petty officer, with a tour overseas, a period of more than two years, before he got his first day of leave in the Navy. Later, when he was a division officer and a young sailor would complain that he hadn't had leave in a while. Emerson would say, "Have a seat, let me tell you my sad story."

After flight training, Aviation Pilot First Class (AP1) Emerson was assigned to Fleet Aircraft Service Squadron (FASRON) 119 in Saipan. There, he accumulated experience early in his career by taking on three big responsibilities at once, as maintenance officer, technical librarian and operations officer.

During his next tour with VR-3 at NAS Moffett Field, Calif., Emerson made chief, in 1951. Besides flying R5Ds while there, he was one of the Navy's first pilots to fly and instruct in the R6D (C-118).

Between 1953 and 1955, Emerson was one of about 15 enlisted pilots who went through a program to acquire a regular Navy commission. It took him a year to complete the required two years' college equivalency, graduating in 1954 as a 1310 (Naval Aviator).

Later, Emerson was skipper of VP-4, Barbers Point, Hawaii, and had tours in Washington, D.C., under the Chief of Naval Operations and Joint Chiefs of Staff. He was transferred to CinCPacFlt in Hawaii, where he remained until September 1981 when he moved on to his last assignment in the Navy as C.O., Naval Air Reserve Unit (NARU), NAS Whidbey Island, Wash.

He never lost his flair for adventure. In the typical daring style of a Naval Aviator, Capt. Emerson sailed his 42-foot ketch from Hawaii to the coast of Washington between assignments. He points out that during the 24-day cruise he used the sailboat's 50-horsepower diesel engine only in no-wind conditions, for a total of 27½ gallons of fuel over 2,700 miles.

In the Naval Air Reserve community, about one-third of the billets are for regular officers. As C.O. of the NARU, Capt. Emerson held one of these positions. He says this was his first tour with the reserves, and he was extremely impressed with the quality of the people and the stability of the squadrons. He also enjoyed the job's location at Oak Harbor, Wash. According to the ex-NAP, the best feature of being stationed at Whidbey is the warm relationship between the community and the base. In fact, he liked the area so well that he and his wife are considering making it their permanent home after retirement.

While at the NARU, Capt. Emerson added yet another aircraft to the long list already compiled — the C-12, a super little airplane, he says. He is proud of the fact that throughout his 35 years of flying over 20 different aircraft, he wore the same pigskin flight jacket. Only the cuffs and waistband were replaced when they literally rotted off. So, when someone came to him requesting a new flight jacket, Capt. Emerson said, "Have a seat, let me tell you about *my* jacket."

"Have a seat, let me tell you about my jacket."

When asked what changes he has seen in Naval Aviation over the past 40 years, Capt. Emerson simply states, "Professionalism." He says that he lost a lot of friends in the old days due to needless accidents. He believes the NATOPS (Naval Air Training and Operating Procedures Standardization) program and the professional flying skills of today's pilots have lowered the accident rate to less than one-tenth of what it used to be.

Capt. Emerson has thoroughly enjoyed his 40 years of naval service. From seaman apprentice to Aviation Pilot First Class to commissioned officer and Naval Aviator, he's had an impressive caréer. But he looks upon retirement as a new beginning. His plans include cruising in his sailboat with his wife, Alice, visiting relatives in Canada and Scotland, and renewing ties with his children and their families. He still owns the old homestead in Canada and his travels may take him back there. He laughs when he says the population of his hometown has really grown over the years — to 173.

The ex-NAP has played a key role in an important chapter of Naval Aviation's story. On the subject of his enviable success, he says much credit goes to his wife of 37 years for her support and adaptability in his nomadic military life.

When reminiscing about his days in the Navy, Capt. Emerson recalls with amusement how occasionally someone would look at the original name tag on his 35-year-old flight jacket and ask, "What's an AP1?" The ex-enlisted pilot would smile and say, "Have a seat, let me tell you all about it." ■

40 Years Filled to the Brim

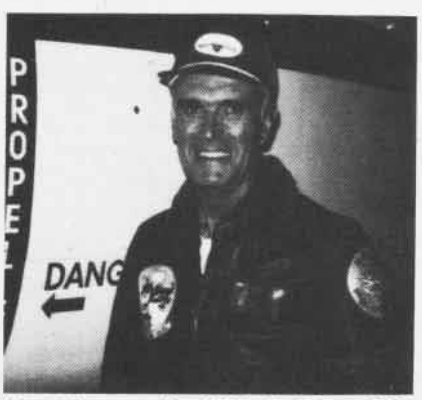
During his career, Capt. Emerson logged more than 7,300 hours flying over 20 aircraft, including the N2S, SNJ, SNB, PBY, PB4Y-2, TBM, F6F, TD2C (radio-controlled drone), R4D, R4D-8, R5D (C-54), R6D (C-118), UF (search and rescue aircraft), JRF, P2V-5, P2V-5F, S-2, C-1A and the P-3, his all-time favorite.

Following FASRON-119 and VR-3, Emerson had tours aboard NAS Alameda, Calif.; VP-4; NS Kodiak, Alaska; VTU-611 (later VT-28); USS *Hornet*; and VPs 46 and 31.

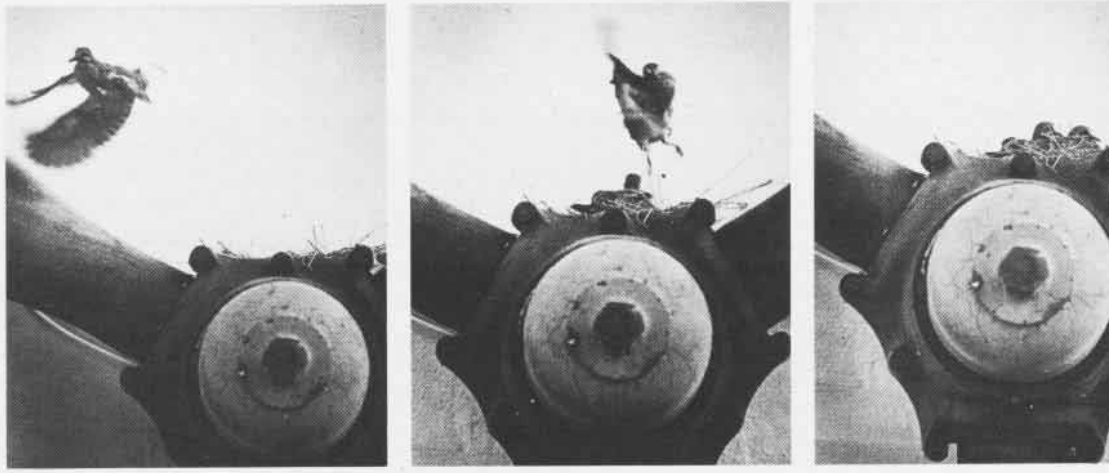
He earned his B.S. degree in 1962 and his master's in 1971 from the Naval Postgraduate School, Monterey, Calif.

After commanding VP-4, Barbers Point, Hawaii, he was assigned in Washington, D.C., as an aviation plans officer under the Chief of Naval Operations and logistics planner in the Joint Chiefs of Staff. From there, he went on to the staff of Commander in Chief U.S. Pacific Fleet in Hawaii, and served his last tour in the Navy as C.O., Naval Air Reserve Unit, NAS Whidbey Island, Wash.

He married his childhood sweetheart, Alice Anderson, 37 years ago and they "raised and launched" six children during their time in the Navy. ■



Capt. Emerson in 1982, beside a C-12, sporting his 35-year-old flight jacket. He says, "My hair gave out about the same time as the jacket's waistband and cuffs, which I replaced. The hair was a lost cause." Perhaps that's why he's wearing his cap from the Silver Eagles Association for ex-NAPs.



Doves caught in a nest built on a C-1 Trader propeller hub take flight at the arrival of workmen. Mechanics assigned to remove parts from stricken aircraft have learned to carry long sticks to discourage the more intimidating inhabitants, such as rattlesnakes.

Please, Don't Call It a Boneyard

Story and Photos by JOC Kirby Harrison

Wingtip to wingtip they stretch across the near-desert, baking in the dry heat of southern Arizona's old pueblo country. There is acre after acre of airplanes and row after row of old Navy P-2 *Neptunes* and more recent vintage A-4 *Skyhawks*.

There are more than 3,400 aircraft from all the services in various states of preservation at the Military Aircraft Storage and Disposition Center in Tucson's outskirts. In places, it looks like nothing so much as an aviation elephant graveyard where the bones are of aluminum and stainless steel. But the people who run the center emphasize that it is *not* a boneyard, pointing out that fewer planes remain here than return to new life in active service – and that the few which do meet their demise at the center do so only after giving up millions of dollars worth of spare parts as salvageable items.

At the Navy Field Service Office on the huge Davis-Monthan Air Force Base, Aviation Machinist's Mate First Class Gary Elliott* says that of 66 Navy aircraft received between August 1981 and April 1982, 41 have been returned to the fleet. That figure, he adds, does not reflect foreign sales of 17 aircraft which netted $1.7 million. *(Continued)*

One of 121 old P-2H Neptunes at the center now patrols little more than a few acres of dry brush, miles from the Pacific Ocean. The Neptunes were replaced in the late '60s by Lockheed's newer, faster and more sophisticated P-3 Orions.

Elliott and Master Chief Aircraft Maintenance Technician Robert Olson are the military side of the five-person field service office under Director Robert Bowen. The office also includes industrial specialist Raymond Diza and secretary Sandy Shverha. It is part of the Naval Aviation Logistics Center, home-based at NAS Patuxent River, Md., and is responsible for carrying out directives on the disposition of Navy aircraft, issued by the office of the Deputy Chief of Naval Operations (Air Warfare).

The small group at the field service office is kept busy coordinating the arrival, return, and disposal of Navy aircraft sent to the center as surplus. The arriving planes receive an initial evaluation, safety equipment is disarmed, black boxes and classified material are removed, and missing parts and components are identified. The planes are then washed down and given an acid bath to retard future corrosion. Fuel tanks are flushed and a lightweight oil applied to prevent rust. Hydraulic fluids are tested for impurities and all openings to the plane are sealed with tape and sprayed over with a white sealer to reflect heat.

"Actually, the aircraft aren't completely sealed," says Elliott. "If you look at the cockpit canopies, you can see small hoses coming out of the side and angled down. These allow an equalization of pressure and humidity between the outside and the aircraft interior." According to Elliott, if the plane were totally sealed, temperatures in the interior would go up well over 200 degrees (Fahrenheit) during the day, and when the air cooled at night the humidity would form condensation that could ruin the equipment still left inside.

After the preservation process, the aircraft are towed to a parking site and inspected regularly thereafter. At various times, the aircraft are opened, and the engines started and run. Of the approximately 1,300 Navy aircraft at the center, 300 are presently maintained in what is called "inviolate storage." Says Master Chief Olson, "They are kept in flyable condition and no parts may be removed without approval from the appropriate aircraft class desk at the office of CNO."

Some Navy aircraft arrive with orders to be placed on the stricken list. These also go through the initial evaluation and preservation process. They are then either placed on hold or made available as a source of spare parts for similar aircraft in the fleet.

As a source of spare parts for all the services, the planes at the storage and disposition center represent a significant savings for the American taxpayer. The center's commanding officer, Air Force Colonel Paul Dudley, says 71,326 spare parts were reclaimed in FY 81; 17,953 of them were priority items. The cost of new parts would have been approximately $230 million.

The sale of surplus aircraft (from all the services) to other nations represented an income of more than $12 million in FY 81, and the center is presently holding 68 Navy *Skyhawks* for Malaysia. The cost of aircraft to friendly nations is not made public, but Master Chief Olson confirms that

Below-left, a C-1 Trader bears the name "Salt One" and is just one of hundreds of Grumman's carrier onboard delivery aircraft parked at the storage and disposition center in Tucson, Arizona.

The C-1 Trader "Blue Ghost" was well known to the crew of the carrier Lexington. A modification of the Trader added a large, dish-type radome over the fuselage and the designation WF-1 (later dropped) brought about the nickname "Willie Fudd".

An aging Skywarrior, its nose modified to carry instruments, had a long career. Accepted in 1955 as an A3D, BuNo 135411, the aircraft served in seven different squadrons on both the East and West Coasts and with the Pacific Missile Test Center at Point Mugu. It last flew with Hughes Aircraft and was stricken in 1975.

Below, a workman prepares to de-arm the ejection system of an an F-4 Phantom. Right, a mechanic digs deeply into another Phantom while checking the plane prior to the preservation process.

"compared to the original cost off the assembly line, it's a considerable bargain." Another 29 TA-4B versions of the *Skyhawk* are still awaiting disposition for a final foreign sales program.

The value of the preservation program is obvious, by Olson's reckoning. "In FY 81, the center returned 94 aircraft to active service from here. As of May 1982, 162 have been reactivated, 54 of them Navy. These aircraft have an estimated value of about $199.8 million. We don't just dig holes out here and bury old airplanes."

Indeed, four RA-3B photoreconnaissance versions of the old *Skywarrior* were recently brought out of storage and flown to the Naval Air Rework Facility at NAS Alameda. The rework facility is converting the venerable old planes to the ERA-3B (electronic reconnaissance) configuration and they will go to a Second Fleet electronic warfare support group squadron. The multitype aircraft squadron, being activated on the West Coast, will be located at NAS Point Mugu. The *Skywarriors*, after a 10-year rest in the quiet confines of preservation, will return to active service by mid-1983.

Walking through the mesquite between the rows of aging aircraft is a trip through aviation memorabilia. There are no more WW II vintage planes. They've long since gone, either sold abroad, salvaged by museums and such organizations as the Warbirds or Confederate Air Force, or simply disappeared forever into the hungry bowels of dozens of scrap reclamation yards that surround the center. But there is a newer generation of aircraft sharing the desolate confines with jack rabbits, roadrunners and rattlesnakes.

Tucked in a long line of C-1 *Traders* is the venerable "Blue Ghost," affectionately remembered by those who served aboard the carrier *Lexington*. A little further on is a C-1 *Trader* from *Nimitz* bearing the title "Salt One," in large black letters on the engine nacelle.

Among the dozens of A3D *Skywarriors* is one that has a particular niche in the memory of Master Chief Olson. The old A-3B (A3D-2), now propped up on boxes and missing panels where parts have been removed, is the same aircraft in which he crashed on the deck of the carrier *Forrestal*, while flying with Heavy Attack Squadron Five 21 years ago.

"Coming in for a landing," he remembers, "we got a wave-off too late and inadvertently caught a wire as the pilot was applying power to go around. The port landing gear strut collapsed and we swerved into the catwalk where the port-side engine and remainder of the strut hung and kept us from going over. We were lucky no one was injured." Olson says he rarely comes across a reminder of his days as a young sailor without recalling "the day I almost bought the farm."

Among the mass of Air Force B-52 bombers are more aircraft with a history out of the ordinary. Still dressed in the rust-red colors is Boeing's 707 prototype, destined for a future Smithsonian National Air and Space Museum satellite facility in Washington, D.C. Looking oddly out of place are Boeing's YC-14 and Douglas' YC-15, both entrants in the Air Force's search for a short takeoff and landing transport/cargo jet, and both victims of budget cuts.

A growing number of civilian aircraft are also arriving at the storage and disposal center. They are planes impounded after use in various illegal activities. "Those were sent here when the owners were caught smuggling drugs," says Elliott, pointing to an assortment of small private planes, some of them sleek, new turboprop models. Also awaiting a decision by government officials is a 707 from a small airline. The aircraft had been leased on charter and when stopped by customs agents was found to be carrying an illegal arms shipment.

"That's one of the fascinating parts of working here," says Olson. "There is always some bit of history on display, and there's always something new. We're never bored, and the truth is that nothing really gets buried here.

"Please, don't call it a boneyard."■

**AD1 Elliott has been transferred and is now in aircrewman training in San Diego.*

Boeing's 707 prototype sits in a field of B-52 bombers, awaiting one last trip to the Smithsonian's National Air and Space Museum. Museum officials plan to display the aircraft in a "satellite" museum facility, possibly at Washington's Dulles airport.

By Jeanne Gray

Glenn L. Martin

Naval Aviation Hall of Honor

Glenn L. Martin was called the "Flying Dude," by those who knew him. He earned his nickname by always dressing in his Sunday best whenever he went flying. He was a man of foresight and perseverance, and became one of the most outstanding figures in American aviation history. Glenn Martin started at an early age building kites fashioned like biplanes, and went on to produce the well-known and venerable Martin bombers. He is recognized as one of the early pioneers in aviation and is one of the second group to be enshrined in the Naval Aviation Hall of Honor.

Glenn Martin was born on January 17, 1886, in Meaksburg, Iowa, the son of a businessman and a schoolteacher.

Martin became interested at an early age in both designing and making things that flew. He had already begun to show his understanding of the mechanics of flight when at the age of six he made his "biplane" kite, out of wood and twine, that stayed in the air for hours. When the other boys his age became fascinated with his creation and wanted one of their own, the industrious Martin began making similar kites in his mother's kitchen and sold them for a quarter each.

As a boy, he enjoyed hunting and studied the different shapes and sizes of birds in flight. He noted that prairie birds with wide stubby wings rose rapidly but only flew short distances at slow speeds. Ducks by contrast had short tapered wings and rose slowly but flew rapidly for great distances.

His father cared little for his son's interest in flight. It pleased him more to see young Martin take apart a cultivator and use the wheels in what he considered a more typical childish project. However, his mother had faith in him and became one of his strongest supporters throughout his life.

The Martins moved to Salinas, Kans., in 1894. He got his first job in his second year of high school working in a bicycle shop. By that time the automobile had arrived at Salinas, and Martin became obsessed with learning to be a mechanic. After a short time there wasn't a moving part in the "horseless carriage" that Martin was not familiar with. It was this knowledge that served him well later on in aviation.

One day in 1904, the Salinas newspaper carried the story of the Wright brothers who had stayed aloft for 1 minute and 40 seconds at Kitty Hawk, N.C. Martin told his mother that their aircraft was like one of his kites except that theirs had a motor. The idea was exciting and he announced he was going to fly, too.

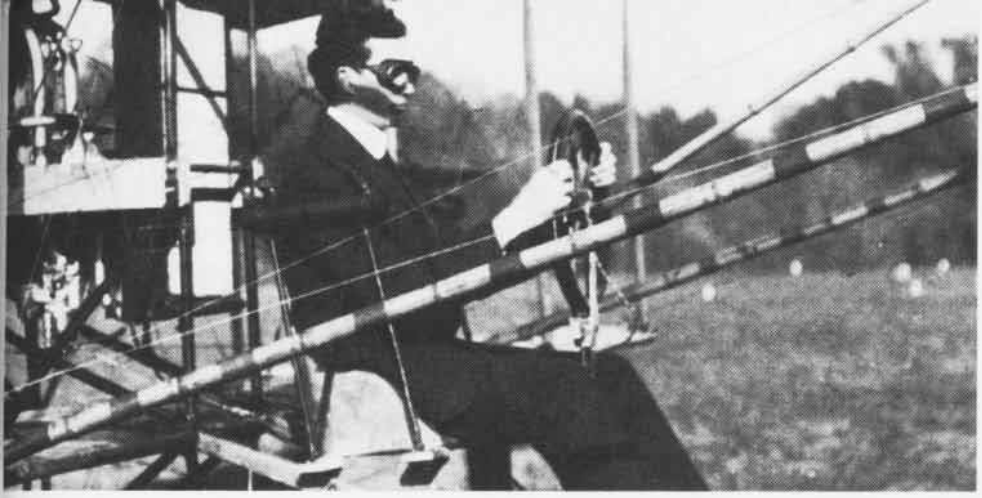
In 1905, Martin's father took a position with a hardware firm in Santa Ana, Calif. There, Glenn saved enough money to open his own garage and secured an automobile dealership. At the same time, he secretly continued to design aircraft. By 1907, rumors began to spread in town of sightings of silhouettes of wings gliding over the knolls at dawn. His designs were still at the glider stage because he lacked funds for an engine. Finally, taking shape inside his garage was the first airplane Martin created, consisting of a bamboo frame, silk, wires and a 12-horsepower, four-cylinder Ford engine.

He took the airplane out for its first test flight in a field near his garage. Martin was taxiing around to get the feel of it when he opened the throttle wide, causing the machine to take off with Martin barely holding on to the frame. The plane crashed but he was not seriously hurt. However disheartening, it was his first aviation experience.

Martin set to work building another airplane. This time, in 1908, he took refuge in an abandoned church so that he could work secretly on his plans for another plane without being disturbed by the town's ridicule. Still using the Ford automobile engine, he built a copy of the early front-elevator, single-surface Curtiss pusher. On August 1, 1909, at daybreak, Martin climbed aboard, opened the throttle and took off without any preliminary tests. He flew about 100 feet and became the first man to fly in California.

Although Martin and his two mechanics, Roy Beall and Charles Day, continued experimenting, they were unable to fly significantly further because the engine had insufficient power. Martin obtained a three-cylinder, 30-horsepower, two-cycle aircraft engine and the experiments went on. In December 1910, Martin decided to enter his plane in a Los Angeles air show called "Events for Novices." Martin made the best showing and, to his surprise, flew 12 minutes which won him the grand prize of $450. This event had attracted the attention of sportsmen who wanted Martin to build planes for them. Martin lacked financial backing and decided to fly more exhibitions to gain support. This plan proved successful, and so Martin told Beall and Day they were going to begin building airplanes. They moved out of the old church and rented an old canning factory in Los Angeles. The Glenn Martin Company was started.

Martin continued flying exhibitions at West Coast fairs and carnivals, and obtained Pilot License No. 56 in Santa Ana in August 1911. He also became a member of the California Aero Club which granted him the State Pilot License No. 2.



Glenn L. Martin at the controls of one of his early aircraft.

Martin watched his company expand and hired more men. Soon the company outgrew the canning factory and moved into a larger building in Los Angeles. There he hired Lawrence Bell as his shop foreman, who much later went on to form his own company, the Bell Aircraft Corporation. Soon Martin began thinking about the military application of his aircraft.

During 1911-1912, the shop built the first Martin hydroaeroplane. He continued with exhibitions and among many events staged an aerial bombing demonstration by dropping bags of flour on a mock fort. He also completed an over-water flight from Newport Beach to Catalina Island with the Martin hydroaeroplane. Once again, Martin's interests diversified — he opened up a flying school, and formed his own commercial airline.

While Martin was in Chicago doing exhibitions, the company brought out two new planes in an effort to gain military acceptance. One was called the Martin "Military Scout," a pusher biplane with tricycle gear and a Curtiss engine. The other was called the Martin "Model T," a tractor biplane, with a Curtiss engine and a four-wheel landing gear. The latter proved to be an excellent trainer which took precedence over the Scout model. Martin set a new American altitude record with passengers aboard on November 26, 1913, flying the new Model T tractor to 9,800 feet.

The U.S. Army gave Martin an unexpected opportunity to demonstrate one of his planes in early 1914 when he agreed to equip a Model T with dual controls. He delivered it to North Island, San Diego, Calif., for evaluation, and remained there until the tests were completed. It was there that Charles Broadwick made parachute jumps from Martin's aircraft — the beginning of the Army's interest in parachutes. He modified the Model T type tractor and designated it the TT, the main difference being the two-wheel landing gear. The tests at North Island were successful and 17 Model T and TT planes were delivered to the Army. This was the start of Martin's long career in government contract work.

He continued developing the tractor machines in 1915 and went on with parachute jump demonstrations at San Diego. That same year Martin delivered two hydroaeroplanes to the Dutch government in Java. In 1916, he was busy building the Martin Model S Tandem and Martin Model R Tractor with many new improvements, and the Model TT trainer planes with four-cylinder Hall-Scott engines, to fill government orders.

A merger was made with the Wright Company to increase wartime production, but in 1917 Martin was dissatisfied with this arrangement and formed another company in Cleveland, Ohio. The new Glenn L. Martin Company started manufacturing aircraft in WW I which included Martin bombers carrying payloads up to 24,000 pounds.

Martin was established as the prime contractor for all military planes, and the Cleveland factory expanded to meet Navy and Army requirements. The factory produced torpedo planes, bombers, submarine scouts, observation and special planes for air mail service. In 1922 the company built the first Navy all-metal-structure monoplanes, both as landplanes and seaplanes. Martin bombers were used by Billy Mitchell in sinking German vessels off the coast of Virginia in 1921.

Martin finally decided to leave Cleveland for Baltimore, Md., because of overcrowded conditions. This new area offered unlimited space and would provide a natural testing bed, the Chesapeake Bay, for the large seaplanes he envisioned. The Cleveland plant was sold and in October 1929, his staff and 1,500 employees moved to the new plant.

Prior to WW II, the Martin Company built dive bombers, clipper-type flying boats and coast patrol flying boats. In 1938, it was necessary to expand the factory once again. Martin introduced the Maryland B-10 bomber in the 1940s and the huge Martin *Mars,* considered the largest aircraft in the world at that time. When WW II began, the Glenn L. Martin Company was the largest aircraft manufacturing firm in America. By 1942, the Martin Company had produced 7,420 military aircraft at the Baltimore plant and had started a new branch in Omaha, Neb. About that time, Martin became president of the National War Production Council.

In the postwar years, production of military aircraft tapered off and the pendulum began to swing towards commercial aircraft. In 1945, Martin began to manufacture the Martin 202 for the commercial market, and the Martin 404 in 1950. The company also began conversion to accommodate aerospace requirements.

Martin eventually sought a place to relax and bought a country estate on the Chesapeake Bay near Chestertown, Md. It was there, at the age of 69, that Glenn Martin suffered a cerebral hemorrhage on December 4, 1955. He died later at the University Hospital in Baltimore.

The source material for this story came from a manuscript "Flying Pioneers Biographies" by Harold E. Morehouse on file in the National Air and Space Museum Archives.

ORGANIZATIONS
FOR ALL SEASONS

It has been said that the world is a scene of changes. It is no different in the world of Naval Aviation where technological development over the last 70 years has been marked by a significant progression of changes. Staying abreast of developments has become more difficult, so many organizations have been established to promote interest in and encourage understanding of the technical aspects of Naval Aviation.

But there is more to Naval Aviation than flying machines, aviation ships and state-of-the-art technology. The pilots, support personnel, decision makers, engineers, manufacturers and enthusiasts all have vested interests in the changes happening in Naval Aviation. The same organizations make it possible to stay current on "people" news in the field.

Naval Aviation News has compiled the following list of some of the groups which may be both helpful and interesting to our readers.

Naval Aviation-related organizations:

The Early and Pioneer Naval Aviators Association (Golden Eagles), Attn: Maj.Gen. John P. Condon, USMC (Ret.), 400 Madison Street, Alexandria, VA 22314, (703) 836-2141. This association was formed by a group of early Naval Aviators who were guests of the Navy on a cruise aboard *Forrestal* in September 1956. The purpose of the organization is to advance the interest of U.S. Naval Aviation by maintaining and expanding the bonds of past service connections. Originally, the group's exclusive membership of 200 included most of those still living who were pioneers in Naval Aviation, and whose designation number as Naval Aviators was within the first 1,900 who qualified for their wings. In 1977, it was decided that the future of the organization depended on membership solicitation of individuals who were exceptionally qualified Naval Aviators to offset natural attrition. Leading figures in Naval Aviation are considered periodically and invited to join in order to keep the membership at 200. There is an annual convention in the spring, but plans for the 1983 meeting have not been finalized. Members receive a quarterly newsletter to keep them up to date on the Golden Eagles' activities.

Association of Naval Aviation, Inc. (ANA), 5205 Leesburg Pike, Suite 200, Falls Church, VA 22041, (703) 998-7733. Chartered in 1975, ANA is a nonprofit organization dedicated to the support of Naval Aviation, and the promotion of maritime aviation and a strong military posture. Presently numbering some 10,000, ANA membership is open to civilians and military personnel of all services, all ranks and ratings, regular or reserve, active or retired, who are interested in carrier aviation. The 1983 annual convention/symposium will be held June 2-4 in Norfolk Va.; in 1984, San Diego, Calif.; 1985, Washington, D.C.; 1986, Pensacola, Fla.; and 1987, San Francisco, Calif. The principal voice of the association is a quarterly magazine, *Wings of Gold,* which addresses various issues related to the aviation profession and a strong maritime air posture.

Marine Corps Aviation Association (MCAA), P.O. Box 296, Quantico, VA 22134, (703) 640-6161. MCAA is a nonprofit organization incorporated in the Commonwealth of Virginia in 1972 to carry on the work and spirit of the First Marine Aviation Force Veterans Association, a group of Marine Aviation veterans who served together in WW I prior to November 30, 1918. Its purpose is to perpetuate the spirit of comradeship in Marine Aviation, foster and encourage professional excellence, and recognize noteworthy achievements. Regular members must be Marines or members of the Armed Forces, past and present, who have served with Marine Corps Aviation units. Associate members may be those with an interest in Marine Corps Aviation or widows of those qualified for membership. MCAA's 1982 Convention and Aviation Symposium is being held at the Hyatt Regency, New Orleans, La., September 30 through October 3. Future convention sites will be in San Diego, Calif., 1983; Washington, D.C., 1984; Chicago, Ill., 1985; and Dallas, Texas, 1986. The association publishes a quarterly newsletter, *The Yellow Sheet,* which is distributed to all members.

Naval Aviation Museum Foundation, Inc., Attn: RAdm. W. H. McLaughlin, Jr., USN(Ret.), NAS Pensacola, FL 32508, (904) 453-1844 or 433-7104. The Naval Aviation Museum Foundation (formerly a civilian booster organization established in 1966 as the Naval Aviation Museum Association) was incorporated in 1975 under the laws of the State of Florida as a nonprofit organization to foster and perpetuate the Naval Aviation Museum, and as a medium of informing and educating the public on the important role of U.S. Naval Aviation. The foundation, through contributions from its individual and corporate supporters and a grant from the State of Florida, has provided nearly all of the funds for the capital development of the first two of the planned five development phases of the museum. The Navy supports the operation and maintenance of the museum and has gained an in-house capability for aircraft restoration and display construction. The membership of the association consists of those individuals, corporations or groups dedicated to the purposes and intents of the museum. The association's biannual publication, *Foundation,* keeps the membership informed of the activities and progress of the museum and the efforts of the foundation.

Navy Helicopter Association (NHA). P.O. Box 460, Coronado, CA 92118, (714) 437-5708. In 1970, NHA was established as a nonprofit, professional and social organization composed of Navy, Coast Guard and Marine Corps aviators, aircrewmen, and support personnel who are active, reserve or retired. The association was formed to promote recognition of helicopters in Naval Aviation and to keep members informed of new developments and accomplishments. The 1983 NHA convention is scheduled for April 27-29 in Norfolk, Va. The organization relies upon membership dues to support its publication, *Rotor Review.*

Silver Eagles Association, Inc., 2002 N. "D" Street, Pensacola, FL 32501. The purpose of the association is to further the fellowship of Naval Aviation Pilots (NAPs) and to perpetuate the prominent role these enlisted pilots played in the pioneering, development and progress of Naval Aviation. Regular and associate membership is limited to all former and present enlisted pilots of the Navy, Marine Corps and Coast Guard. This includes all enlisted personnel who were designated NAPs, and those who were ordered to or entered flight training as student NAPs and were appointed to warrant officer grade or commissioned as officers prior to being designated Naval Aviators. The Silver Eagles' annual convention will be held October 7-9, 1982, at Stouffer's National Center Hotel, Arlington, Va. A quarterly news bulletin, *Scuttlebutt,* is sent to all members.

The Tailhook Association, P.O. Box 40, Bonita, CA 92002, (714) 479-8525 or 479-8896. The association was incorporated in the State of California in 1968 to encourage, support and educate those interested in the aircraft carrier, and her aircraft, pilots and aircrewmen. Regular membership is open to anyone who has made an arrested carrier landing, either as a pilot or aircrew member. Associate membership is available to anyone who has the desire to support U.S. Navy carrier aviation. The 27th Tailhook Reunion and Naval Aviation Symposium will be held September 16-18, 1983, at the Las Vegas Hilton, Las Vegas, Nev. *The Hook* is published quarterly as the association's official journal.

Aviation Boatswain's Mates Association, Attn: CWO Gerald White, OinC, NATTC Lakehurst, Det Norfolk, Bldg. U-46, NAS Norfolk, VA 23511, autovon 690-3517, commercial (804) 444-3517. Established in 1975, this nonprofit organization is composed of men and women who are or have been aviation boatswain's mates (ABs). Associate membership is available to those who support the goals of the association, which include promoting AB comradeship worldwide, improving the AB rating through workshops at the annual conventions, and selecting an AB of the Year from the Pacific and Atlantic Fleets. Conventions are held yearly on the third Wednesday of July with the sites rotating between the East and West Coasts. The 1982 symposium took place in Norfolk, Va. Members receive periodic newsletters to keep them up to date on the organization's activities.

Flying Midshipmen Association, 1506 S. 22nd Street, Arlington, VA 22202, (703) 521-0050. Aviation midshipmen were part of a program authorized in 1946, but discontinued after a brief period, which sent newly designated pilots to fleet squadrons as midshipmen for up to two years before they were commissioned as ensigns. This organization was formed in 1969 to promote legislation to credit aviation midshipmen with their time spent before commissioning, for pay and retirement purposes. Since implementation of the law which adjusted the base pay entry dates of all aviation midshipmen in 1974, the association has been a nonprofit, fraternal organization to promote the fellowship and mutual benefit of its membership. Membership is open to any person who has held the rank of Aviation Midshipman in the U.S. Navy flight training program. An annual convention is held on the West Coast and the first national convention took place in Pensacola last April. Members receive a newsletter on current activities.

Naval Air Transport Squadrons, Inc., Attn: Capt. Alvin R. May., Jr., USNR(Ret.), 1015 W. South Avenue,

Independence, MO 64050, (816) 252-8466. Membership in this organization is limited to officers and enlisted personnel who served under the Naval Air Transport Service or fleet logistics air wings during WW II. From a small reunion of former members, this group has grown to a membership of 1,200. The most recent reunion in August this year was in Pensacola, Fla.

Navy Flying Clubs, Naval Military Personnel Command, NMPC-652, 1300 Wilson Blvd., Arlington, VA 22209, autovon 224-2853, commercial (202) 694-2853. Basic policies, procedures and responsibilities for the operation of these clubs are set forth in OpNavInst 1710.2B. The purpose of Navy Flying Clubs is to provide Navy personnel, their families and other authorized personnel an opportunity to develop skills in aeronautics and other aerosciences and to provide a social program to promote Navy morale. Membership is on a voluntary basis and subject to the approval of the activity commander. Active membership is limited to active duty U.S. military personnel. Associate members may be dependents of active duty personnel, retired U.S. military personnel and their dependents, full-time civilian employees of the Department of Defense, or members of the U.S. Armed Forces Reserve.

Other aviation-related organizations:

Air Traffic Control Association, Inc. (ATCA), 2020 N. 14th Street, Suite 410, Arlington, VA 22201, (703) 522-5717. Founded in 1956, the association is an independent, nonprofit professional organization of individuals and corporations concerned with the continuing safety, reliability and efficiency of the U.S. air traffic control system. Its membership is composed of civilian and military (active or retired) air traffic controllers, flight service specialists, pilots, electronics engineers, electronics technicians, and representatives from related aviation industries. The ATCA 27th Annual Meeting and Technical Program will be held at Bally's Park Place, Atlantic City, N.J., October 17-22, 1982. Membership includes subscription to *The Journal of Air Traffic Control,* published quarterly, and the monthly *ATCA Bulletin.*

American Aviation Historical Society (AAHS), 2333 Otis Street, Santa Ana, CA 92704, (714) 549-4818. Founded in 1956 as a nonprofit, educational organization to encourage interest in and the dissemination of knowledge of significant importance to aviation history, the society now has a worldwide membership. For the aviation history buff, membership provides a source of factual historical data compiled by leading aero historians. In addition to the quarterly *AAHS Journal,* members receive a quarterly newsletter containing chapter news, information on research projects, museum news and items of interest that are of time-decaying nature. Members also have access to a free "wants and disposals" section, free use of the photographic negative lending library containing over 10,000 negatives, plus a book service offering a discount on many leading book titles. An annual meeting/convention takes place on the West Coast.

Navy Flying Clubs exist at the following locations:

NS Adak, Alaska
NAS Agana, Guam
NAS Alameda, Calif.
NAS Atlanta, Ga.
NAF Atsugi, Japan
NAS Barbers Point, Hawaii
NAS Brunswick, Maine
NWC China Lake, Calif.
NAS Cubi Point, R.P.
NSWC Dahlgren, Va.
NAS Dallas, Texas
NAF Detroit, Mich.
NAF El Centro, Calif.
NAS Glenview, Ill.
NTC Great Lakes, Ill.
NSB Groton, Conn.
NS Guantanamo Bay, Cuba
NAS Jacksonville, Fla.
Kansas City, Mo.
NS Keflavik, Iceland
NAS Key West, Fla.
NAEC Lakehurst, N.J.
NAS Lemoore, Calif.
NS Long Beach, Calif.
NAS Memphis, Tenn.
NAS Moffett Field, Calif.
NPS Monterey, Calif.
NSA Naples, Italy
USNA Annapolis, Md.
NAS New Orleans, La.
NETC Newport, R.I.
NAS Norfolk, Va.
NAS North Island, Calif.
NAC Orlando, Fla.
NAS Patuxent River, Md.
NAS Point Mugu, Calif.
NS Roosevelt Roads, P.R.
NS Rota, Spain
NAS South Weymouth, Mass.
NAPC Trenton, N.J.
NARC Twin Cities, Minn.
NADC Warminster, Pa.
NAS Whidbey Island, Wash.
NAS Whiting Field, Fla.
NAS Willow Grove, Pa.

American Helicopter Society, Inc., 1325-18th Street, N.W., Suite 103, Washington, DC 20036, (202) 659-9524. Established in 1943, the society's purpose is to promote and expand helicopter and vertical flight technology and its useful application throughout the world. Anyone involved in or interested in the helicopter industry is welcome to join. The 1983 annual forum will be held May 9-11 in St. Louis, Mo. Membership includes two publications, the bimonthly *Vertiflite* and quarterly *Journal of the American Helicopter Society.*

American Institute of Aeronautics and Astronautics, 1290 Avenue of the Americas, New York, NY 10104, (212) 581-4300. The institute is the United States' largest and oldest technical society devoted to science and engineering in aviation and space technology and systems. It is composed of some 30,000 individual members, including 5,500 students, and 70 corporate members. Its purpose is to advance the arts, sciences and technology of aeronautics and astronautics, and to nurture and promote the professionalism of those engaged in these pursuits, as well as serve the professional interests of members and improve public understanding of the profession and its contributions. The society's annual meeting will be held May 10-12, 1983, in Long Beach, Calif. Membership includes a subscription to the monthly publication, *Astronautics & Aeronautics.*

Association of Old Crows (AOC), 2300 Ninth Street, South, Suite 300, Arlington, VA 22204, (703) 920-1600. Officially organized in 1964, AOC is a nonprofit professional association comprised of individuals engaged in the science of electronic warfare. Membership includes scientists, engineers, managers, operators, educators and military personnel in all grades, as well as 800 members from NATO and other friendly nations. The association's National Symposium will be held October 11-15, 1982, in San Francisco, Calif. Members receive the AOC monthly magazine, *Journal of Electronic Defense.*

Combat Pilots Association, P.O. Box 91253, Los Angeles International Airport, Los Angeles, CA 90009, (213) 822-1755. The organization was founded in 1973 as a nonprofit military aviation fraternity with membership open to all service branches and combat airmen. Activities have been oriented to charitable, fund-raising events on behalf of individuals and institutions via sponsored air shows and other aviation-related events. The membership consists mostly of leading figures in military aviation, past and present. The 10th Annual Reunion-Conference was held in Reno, Nev., September 17-19, 1982, in conjunction with the National Air Races.

Experimental Aircraft Association (EAA), P.O. Box 469, Hales Corners, WI 53130, (414) 425-4860. EAA was organized by Paul H. Poberezny in 1953 for people interested in aviation. With a current membership of 90,000, it is basically a sport aviation organization. Anyone is welcome to join and may choose from four separate interest groups: Ultralight Association, Warbirds of America, Antique Classic Division and International Aerobatic Club. Members receive a subscription to the monthly magazine, *Sport Aviation.* The following monthly publications represent the four respective groups: *Ultralight, Warbird Newsletter, Vintage Aircraft* and *Sport Aerobatics.* The Paul H. Poberezny Air Museum, Franklin, Wisc., is open to the public seven days a week and exhibits all types of aircraft and aviation artifacts. The 1983 EAA International Fly-in Convention and Sport Aviation Exhibition, an annual event in Oshkosh, Wisc., will be held July 30 through August 6.

The Lighter Than Air Society, 1800 Triplette Boulevard, Akron, OH 44306, (216) 235-8740. The organization was formed to further knowledge pertaining to the history, science and techniques of buoyant flight; to encourage the use of lighter-than-air transportation; and to establish and maintain a library and museum on lighter than air. Anyone interested in lighter than air may join. An annual banquet is held in Akron, Ohio. This year's meeting will take place on October 16. *Buoyant Flight,* published six times a year, is the official bulletin of the society.

National Aeronautic Association (NAA), 821-15th Street, N.W., Washington, DC 20005, (202) 347-2808. Formed in 1905 as the Aero Club of America, the association was renamed in 1926 and is the oldest independent nonprofit aviation organization in the U.S. As the sole U.S. representative of the Federation Aeronautique Internationale, NAA is the only organization in the United States that can sanction and certify official flight records, both civilian and military, and sponsor U.S. teams participating in world sport aviation championships. Individual and corporate membership is available to those interested in air and space. Aerospace II, a symposium on U.S. aerospace policy, was held September 28-30, 1982, in Williamsburg, Va. The monthly *NAA Newsletter,* in addition to membership circulation, reaches members of Congress, key government officials, the aerospace press, and aviation leaders throughout the world.

Ninety-Nines, Inc., P.O. Box 59965, Will Rogers World Airport, Oklahoma City, OK 73159, (405) 685-7969. The International Organization of Women Pilots was organized in 1929, with Amelia Earhart as its first president. The name Ninety-Nines is derived from the original membership of 99 women pilots. The purpose of the organization is to engage in educational, charitable and scientific activities, to provide a close relationship among women pilots, and unite them in any movement for their benefit or for that of aviation in general. Membership is limited to women having active pilots' licenses. The 1983 annual international convention will be held August 10-14 in New Orleans, La. The official publication of the organization is *The 99 News,* published 10 times a year. ■

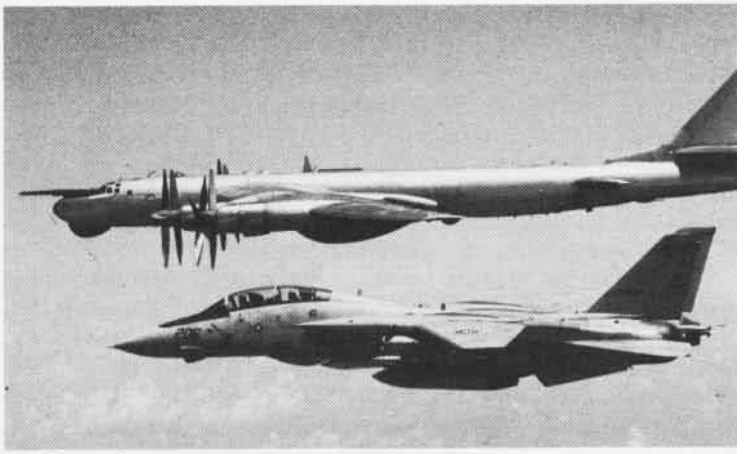
TOUCH AND GO

Swordsmen Stay Sharp

The *Swordsmen* of VF-32, nearing completion of a deployment aboard *Independence*, have been setting records and putting a lot of flight time on their F-14 *Tomcats*. The squadron logged 72 flight hours in the first 15 hours of Exercise *Mobile Sea Range*, conducting combat air patrol intercepts against "enemy" aircraft raids. The intercepts continued through the second day and included intercept of two Soviet *Bears* and the job of escorting them clear of the carrier. On day three of the Caribbean exercise, the *Tomcat* crews successfully fired *Sparrow* missiles at unmanned drones launched against the battle group.

Airborne refueling for the VF-32 interceptors was provided by VAs 176, 15 and 87, and airborne early warning and control was handled by VAW-122. Carrier Group Eight received an effectiveness rating of 98 percent for the manned aircraft raid portion of the exercise, setting a new mark for a two-carrier battle group.

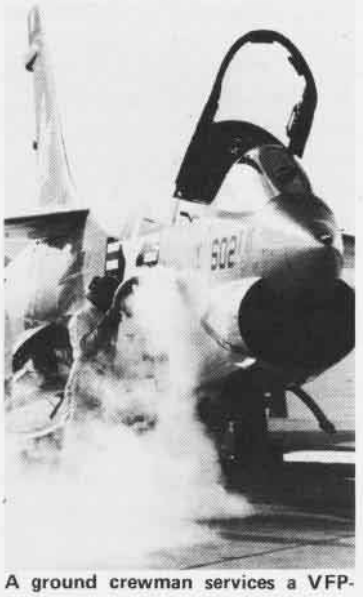
During three days of continuous flight operations while deployed, VF-32 logged 70 sorties and 155 flight hours on missions ranging from long-range, combat air patrol to tactical air reconnaissance pod system tasking. **Ltjg. Mike Mock**



Lts. Byron Olson and Ron Rahn of VF-32 escort a Soviet Bear during a long-range, combat air patrol mission off Independence.

Derby Day At Fallon

PH2 Todd Nielson



A ground crewman services a VFP-306 Crusader with liquid oxygen during the photo derby.

Lieutenant Commander Craig Grover of Light Photographic Squadron (VFP) 306, flying an RF-8G *Crusader*, took top honors in the Best Aircrew category at the third annual World Famous Open Class Photo Derby June 26 through July 2 at NAS Fallon, Nev.

The Chief of Naval Reserve-sponsored contest placed air, maintenance and intelligence crews from 13 aviation units in head-to-head competition in areas of photography, airmanship, maintenance and intelligence interpretation, based on the results of missions flown over predetermined routes.

As icing on the competition cake, the VFP-306 intelligence unit, responsible for mission planning and film interpretation, finished second in the Best Photo Intelligence Team category, just 2.5 points behind the first place 152nd Tactical Reconnaissance Group of the Nevada Air National Guard.

The Best Maintenance award went to Marine Tactical Reconnaissance Squadron Three from MCAS El Toro. The 124th Tactical Reconnaissance Group of the Boise, Idaho, Air National Guard took home the overall derby championship.

Rear Admiral F. F. Palmer, Chief of Naval Reserve, was on hand to present the awards at a banquet marking the end of the last day of competition. **Lt.Cdr. Tom Crews**

Last Launch of the Bomarc

The threat simulation department of the Pacific Missile Test Center (PMTC) marked the end of an era July 14, when it launched from its Vandenberg Air Force Base site the last of the Navy's *Bomarc* missiles.

Originally an Air Force missile designed to defend the U.S. against massive air attack, the *Bomarc* has been used since 1966 by the test center as a high-speed, high-altitude target that closely simulates the Soviet *Foxbat* aircraft.

The final launch was comprised of two missiles, the first of which flew as programmed. Also as planned, an F-14 *Tomcat* from the carrier *Enterprise* intercepted the *Bomarc* and shot it down with a *Phoenix* missile. Almost as though protecting such an ironic end, the last *Bomarc* failed and had to be destroyed moments after lifting off the launch pad.

"It would have been nice to bow out of this program with two fantastic shots," said Jim Jensen, associate director of the PMTC department. "But it just wasn't meant to be. Anyway, I think the Navy really got its money's worth."

Between the first and last launch, the Navy made use of 56 of the *Bomarc* "A" models and another 31 of the "B" version. The *Bomarc* will be replaced by the *Firebolt* target missile, currently under development by the Air Force and due for introduction in 1985. Until then, a modified version of the supersonic AQM-37A *Challenger* will be used by PMTC when requirements call for a high-altitude, high-speed target. The Air Force will continue to use the *Bomarc* as a target on the East Coast. **Ray Lucasey**

Ray Lucasey

The PMTC's Bomarc det gathers around the last of the Navy target missiles hours before it was fired in support of a Third Fleet operation.

Black Knights Make Move

The *Black Knights* of Marine Fighter Attack Squadron (VMFA) 314, home-ported at MCAS El Toro, will be the first operational squadron to transition from the F-4 *Phantom II* fighter to the F/A-18 *Hornet* strike fighter, with fleet training already under way.

Other squadrons to make the change in the near future are Marine fighter attack squadrons VMFA-313 and VMFA-531, also based at El Toro, and two as-yet-unnamed Navy A-7 attack squadrons from NAS Lemoore.

The transition cycle will take six months per squadron. Initially, 38 pilots were sent to NAS Lemoore, with increments of pilots arriving each week until a total of 142 Marines have completed the transition phase. VFA-125, the first F/A-18 training squadron, will train the pilots, and the Marine Aviation Training Support Group at Lemoore will provide administrative support.

Training will be in four segments, beginning with indoctrination and aircraft familiarization, followed by classroom theory, practical job training on the aircraft, and work in VFA-125 work centers until the squadron returns to El Toro in December 1982.

As of July, 41 F/A-18 *Hornets* had been delivered to the Navy and Marine Corps; *Hornet* strike fighters have flown more than 12,000 hours and made more than 8,000 flights. **Gidge Pyuen**

Red Wolves Prowl Again

The *Red Wolves* of Helicopter Attack Squadron (Light) Four, better known for their exploits in Vietnam as HAL-4, were recently back in action as a reserve squadron on two weeks active duty for training.

Flying in support of Naval Special Warfare Group Two out of Hurlburt Field, Fla., the unit flew more than 200 flight hours as part of Exercise *Ocean Venture '82*. During that period they delivered more than 275 rockets and 100,000 rounds of 7.62-caliber ammunition in support of UDT/SEAL and Special Boat units. Both day and night, live close air support missions were conducted, in addition to day and night insertion and extraction of SEAL squads. Close terrain flights were conducted over the woodlands of the Eglin Air Force Base reservation, and night vision goggle tactical training completed the syllabus.

The *Red Wolves* of HAL-4 are one of the only two HAL squadrons under operational control of Commander, Helicopter Wing Reserve. The squadrons fly the HH-1 *Huey* gunship. HAL-4 is skippered by Commander Ken Lyons.

A Red Wolf gunship loads up for a live firing mission during Ocean Venture '82.

PEOPLE·PLANES·PLACES

SecNav Energy Conservation Awards

The following aviation commands are winners of the FY 81 Secretary of the Navy Conservation Awards for ship, squadron, Navy and Marine Corps shore activities, respectively: *Independence* (CV-62); VF-74, NAS Oceana, Va.; NAS Bermuda; and MCAS Beaufort, S.C.

The winners are authorized to fly the SecNav energy flag for one year. Each unit was commended for its efforts to reduce energy costs and promote responsible energy management.

Awards

VP-65, NAS Point Mugu, recently received the AVCM Donald M. Neal Aircraft Maintenance Award sponsored by Lockheed Corporation. Como. Donald G. DeBode, ComResPatWingPac, presented the award to C.O. Cdr. Norman J. Haussmann and cited the squadron's accomplishments in corrosion control, in reducing the cannibalization rate and in having the lowest no defect percentage of reserve patrol squadrons during the competitive cycle.

The project manager for the *Harpoon* Anti-Ship Weapon System, Capt. Eugene L. Geronime, has been awarded the Navy's seventh highest medal, the Legion of Merit. VAdm. E. R. Seymour, Commander, NavAirSysCom, made the presentation in a ceremony on June 25. Capt. Geronime received the award for exceptionally meritorious performance of service as *Harpoon* project manager from August 1978 to October 1982. He was cited for successful completion of the *Harpoon* operational evaluation, which resulted in its approval for fleet use in February 1981, and for developing a program to make the *Harpoon* an effective weapon system past the year 2000.

Records

The following units marked accident-free flight-hour milestones: NavAirResFor, 100,000 hours; VP-44, 71,400; VQ-2, 45,000; HSL-31, 40,000; VA-127, 33,500; VT-4 and VRF-31, 30,000; VMO-2, 25,000; HML-167, 19,000; VF-161, 13,700; VMFAT-101, 7,000; VA-86, 5,000; HMM-163, 5,700; and VQ-3, 3,963.

A VQ-3 Hercules flies by the rugged Hawaiian coast.

Other squadrons recorded safe flying in years: VS-33, 22 years; VP-40, 15; VP-45, 13; VA-113, 8; VF-1, 4; VT-24, 3; and VMA-214, 1.

Some flyers marked personal career milestones: VA-122's Lt. Greg Stearns achieved 2,000 hours in the A-7.

Lt.Cdr. Craig Hoffman of VF-121 recently completed his 600th *Tomcat* trap patch.

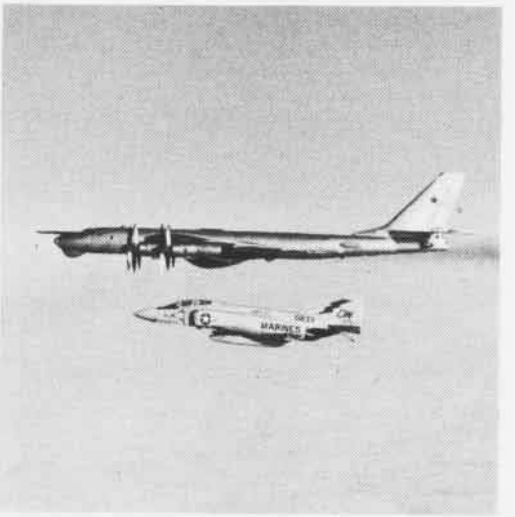
Four *Freelancers* of VF-21, recently recorded their 1,000th flight hour in the F-4: Cdr. Roger Boennighausen, X.O., and Lt.Cdrs. Mike Jones, Fred Koch and Ray Crouch.

The following individuals from VAQ-136 achieved milestones in the EA-6B *Prowler*, logging a combined total of 8,000 flight hours: Cdrs. William A. Dwinell, C.O., and Vic Dodds each surpassed the 2,000-hour mark. Lt.Cdr. Robert Pinnell, Lts. Gerald Spraitzar, Thomas Wood and Lee Draper have passed the 1,000-hour mark.

Honing the Edge

Miramar-based VAW-88 and VR-302 recently returned from their annual two-week active duty deployment to NAS Roosevelt Roads, Puerto Rico. This was the first time reserve squadrons have played the adversary role for the *Forrestal* and *Independence* task groups, supporting CVWR-30. VAW-88 had the opportunity to use the latest tactical computer programs in working with the mobile sea range force. The squadron also provided airborne intercept control services for VF-302 and VC-12, sharpening their air combat maneuvering skills. VF-302 was busy with intensive flight operations beginning with ordnance flights to the Vieques target complex just east of Puerto Rico. It was the first time Roosevelt Roads had hosted West Coast squadrons.

This past spring marked the completion of another successful annual active duty period for the men of VA-305, commanded by Cdr. Doug L. Bailey. The Point Mugu-based squadron deployed to NAS Fallon, with six A-7B *Corsairs* for 10 days. A typical flight during the first week consisted of four to six aircraft. The pilots would fly low level to the target area and practice high-angle dive, laydown, pop-up roll ahead and loft bombing, in addition to strafing. During the second week, practice bombs were replaced with live ordnance. Scenario strikes were planned and executed, utilizing the NAS Fallon and Hill AFB target ranges. To add more realism and increase pilot training, the Pacific Fleet adversaries, VA-127, provided strike opposition. The active duty cruise also afforded an excellent opportunity for the selected air reservists to train with VA-305 in their respective rates. Success of this training was readily apparent from the high aircraft availability throughout the cruise.



Capt. Nick Mamarella

VMFA-251's skipper Lt.Col. Graham Kerr and his RIO Maj. "Dutch" Daubert escort Soviet TU-95D Bear bomber out of Icelandic airspace.

The *Thunderbolts* of VMFA-251 recently completed a challenging deployment to Keflavik, Iceland, where their mission was to provide air defense. Operating in support of NATO and Air Forces Iceland, the *Thunderbolts* overcame difficult weather conditions and a lack of suitable divert fields in order to intercept and identify unknown aircraft entering Icelandic airspace. In all, *Thunderbolt* aircrews successfully completed both day and night intercepts of six Soviet TU-95 *Bear* aircraft. The *Thunderbolts* completed their deployment with a rigorous eight-hour, nonstop translant to Beaufort, S.C., from Keflavik, utilizing USAF KC-135 strategic tankers.

The *Golden Hawks* of VA-303 flying A-7s recently completed a week-long deployment to Luke Air Force Base, Glendale, Ariz., to provide dissimilar air combat training to U.S. Air Force F-15 students. Three aircraft and 10 pilots flew 43 sorties and 117 hours in a week of intensive flying against both F-15 and F-104 aircraft. The training received by the VA-303 pilots in defensive maneuvering against the high-performance aircraft augmented the required training syllabus.

Et cetera

Back in 1969, Capt. Paul Jayson, USNR-R (Editor of *NANews,* and Head, Aviation Periodicals and History Office, 1961-1969) was involved in the restoration of the famous NC-4 for the 50th anniversary of the flying boat's epic flight across the Atlantic. As part of the celebration, the NC-4 was on display on the Mall near the Smithsonian Institution in Washington, D.C.

Recently, Capt. Jayson stepped into the open cockpit of the NC-4, this time at the Naval Aviation Museum in Pensacola, to administer the reenlistment oath to Journalist First Class John Johnson, who had asked for the cockpit swearing-in by his superior in the CNET public affairs office. For the occasion, Capt. Jayson donned his uniform for the first time since his retirement from active duty in 1971. Johnson's next assignment takes him to the photojournalism course at Syracuse University.

Change of Command

ComNavAirPac: RAdm. Crawford A. Easterling relieved VAdm. Robert F. Schoultz.

PatWing-5: Capt. Robert P. Berg relieved Capt. Ronald G. Castle.

PatWing-10: Capt. Jesse J. Hernandez relieved Capt. Bobby C. Farrar.

TraWing-2: Capt. Jimmie W. Taylor relieved Capt. Lester T. Jackson, Jr.

CVW-3: Cdr. John Mazach relieved Capt. B. J. Smith.

CVWR-20: Cdr. James E. Gill relieved Capt. David R. Layton.

HAL-5: Cdr. Robert O. Brockmeier relieved Capt. Wallace D. Tweden.

HM-12: Cdr. R. Van Goodloe, Jr., relieved Capt. Charles E. Brooks.

HMH-462: Maj. Gerald R. Martin relieved Lt.Col. Raul A. Sifuentes.

H&MS-10: Maj. Jimmy L. Whitson relieved Maj. Joseph A. Mitchell, Jr.

H&MS-12: Lt.Col. William C. Peters relieved Lt.Col. Ronald M. D'Amura.

HS-12: Cdr. James D. Ellington relieved Cdr. Thomas J. Clothier.

MAG-12: Col. Edward P. Carroll relieved Col. Kent C. Bateman.

MCCRTG-10, El Toro: Col. Kenneth W. Langford relieved Col. G. O. Booth.

MWSG-27, Det. B., Beaufort, S.C.: Maj. James R. Ballard relieved Maj. Henry S. Carr III.

NAF Kadena: Capt. S. N. Hallmark relieved Capt. W. R. Petersen.

NAF San Nicolas Island: Cdr. John R. Thompson relieved Lt.Cdr. John M. Boggio.

NAMTraGruDet: Cdr. Robert R. Jones relieved Cdr. B. B. Weber.

NARU Whidbey Island: Capt. Donald G. DeBode relieved Capt. John R. Emerson.

VA-42: Cdr. Herbert A. Browne, Jr., relieved Cdr. John A. Pieno.

VA-45: Cdr. Lewis I. Williams, Jr., relieved Cdr. Larry J. Pickett.

VA-82: Cdr. David H. Finney relieved Cdr. Dan H. Ryder.

VA-115: Cdr. William W. Radican relieved Cdr. Robert R. Wittenberg.

VA-146: Cdr. Michael G. Shaw relieved Cdr. William S. Orr, Jr.

VA-147: Cdr. Eric Vanderpoel II relieved Cdr. Frank Bledsoe.

VA-174: Capt. Donald B. Hunt relieved Cdr. Robert S. Smith.

VAW-114: Cdr. Donald K. Covington III relieved Cdr. Henry G. Perkins.

VAW-125: Cdr. Charles Saffell relieved Cdr. Lou Foltzer.

VF-24: Cdr. William P. Bertsch, Jr., relieved Cdr. William H. Switzer III.

VF-41: Cdr. Michael E. Field relieved Cdr. Henry M. Kleemann.

VF-114: Cdr. Jay B. Yakeley relieved Cdr. John C. Ensch.

VMA-513: Lt.Col. James E. Sabow relieved Lt.Col. Woody Gilliland.

VMFP-3: Lt.Col. Joseph G. Thomas relieved Lt.Col. Dennis R. Fitz.

VP-8: Cdr. Thomas B. Nesbit relieved Cdr. Richard L. Norwood.

VP-44: Cdr. Robert T. Fuller relieved Cdr. Benjamin F. Folsom, Jr.

VQ-2: Cdr. Don C. East relieved Cdr. John P. Flynn.

PROFESSIONAL READING

By Lieutenant Commander Peter Mersky, USNR

Kohn, Leo J., *The Story of the Texan.* Aviation Publications, 217 E. Washington St., Box 357, Appleton, Wisc. 54912. 1978. 40 pp. Illustrated. $4.95.

The T-6/SNJ *Texan* has probably trained more military pilots, as well as many civilian flyers, than any other aircraft in the world and, as the author says in the foreword to this paperbound book, ". . . only a handful of very small national entities have not heard the howl of the AT-6 in their skies. . . ." This book carries a short historical text, with many reproductions of pages from the *Texan's* operating manual, including cutaway drawings, range, climb and airspeed charts, and diagrams.

All models of the aircraft are described, giving interesting points of service, including prototypes and foreign involvements.

Foster, John M., *Hell in the Heavens.* Zenger Publishing Co., Box 9883, Washington, D.C. 20015. 1981. 320 pp. Illustrated. $15.95.

Originally published in 1961, this book is another of the minor WW II "flying classics" reprinted by the Zenger Company, and is a welcome reprint indeed. John Foster served in the Solomons with VMF-222 from 1943 to 1944, flying the Chance Vought F4U *Corsair.* He had originally enlisted in the Navy right after Pearl Harbor but transferred to the Marines and learned to fly a variety of aircraft before being ordered to the *Corsair* squadron.

This book is a well-told, "how-it-really-was" story which includes many personal insights. Although the author flew and fought alongside personalities like Marion Carl and Greg Boyington, he is mainly concerned with the day-to-day story of how each man lived through the unbearable heat, jungle diseases, boredom and the periodic stark terror which were the lot of the men in the front line areas of the Pacific war.

Many of the names he mentions never made the front pages of the newspapers. They were just part of the larger overall mass of men fighting the war. It is in this larger anonymous portion of the war that Foster finds so much of his story.

An entertaining, well-written book, it also includes a selection of photographs not used in the earlier 1961 paperback edition, and some appendices of aces, winners of the Congressional Medal of Honor, a brief account of VMF-222's history and its commanding officers. It is recommended that anyone interested in the Pacific, the Marines, and the *Corsair* read this book.

Ginter, Steve, *North American T-28 Trojan, Naval Fighters Number 5.* S. Ginter, publisher, 1754 Warfield Circle, Simi Valley, Calif. 93063. 1981. 66 pp. Illustrated. $8.95.

As the introduction to this paperbound volume points out, many Navy, Marine Corps, Air Force, and foreign pilots have cut their teeth on the T-28 trainer. Therefore, a book on this classic prop trainer is long overdue. Although this is not an in-depth biography, it is filled with fine pictures of the T-28. Every page, covers included, has photos of the *Trojan,* with 12 on the rear cover illustrating various markings and color schemes. The text mainly supports the photo captions, but the book does give an all-around look at the *Trojan's* career as a trainer and a counterinsurgency aircraft in American, South Vietnamese and French service.

All T-28 versions are thoroughly covered, including the U.S. Air Force's initial T-28A with its two-bladed prop. An interesting opening series shows the first configuration as the XSN2J-1 with a conventional tail-wheel landing gear.

A list of books and magazines as source materials, as well as a discussion of available scale model kits, provide an interesting complement to the main body of pictures and text. There are many rudimentary side views with several marking and color schemes, as well as sections of interior and exterior drawings, with photo layouts taken from the *Trojan's* NATOPS manual. Specific Navy training squadrons are also covered in short paragraphs.

Although intended primarily for modelers, this book will certainly provide an interesting and nostalgic memory trip for any aviator who logged time in the T-28.

Letters

Triple Oops

We are writing to you to set the record straight on a point that has been misrepresented twice. It concerns the tactical air reconnaissance pod (TARPS). In your April issue, you stated that VF-211 was the first sea-going squadron to deploy with TARPS. In your August issue on page 43 in "Wing Nine Flies Home" you stated that VF-24 was the first squadron. You were wrong both times. VF-84 on board *Nimitz* deployed as the first sea-going squadron with TARPS on May 15, 1981, with the EDM pod and completed evaluation and training successfully. We then returned to NAS Oceana where we received three production pods in early July 1981. On August 3, 1981, we again deployed with TARPS aboard *Nimitz* for the Mediterranean.

PH1 M. J. Brown
VF-84 TARPS Crew
NAS Oceana, VA 23460

Ed's note: If to err is human, then indeed there are no aliens here. For sure, VF-84 was the first operational squadron to deploy with TARPS. Our thanks to those in VF-84 for setting the record straight, and our apologies to all in the squadron for the oversight.

P.S. There were a few other compound fractures of fact in the August TARPS story. To correct the mistakes, VF-211 was incorrectly identified as VA-211, and VAW-112's Golden Hawks listed incorrectly as RVAW-112. It should be noted that VF-211 rather than VF-24 was the first West Coast operational squadron to deploy with TARPS. Our apologies to the squadrons involved and to Lt. S.S. Robins, in whose original story the information was written correctly.

Aviation Physiology Training

The Navy's Aviation Physiology Training Program seeks inputs. An office has been established to review aviation physiology training, to produce a standard curriculum that prepares flight personnel for all the physiological aspects of flight and to ensure their maximum performance, safety and survival. Any individual or command with comments or suggestions is requested to direct these to Chief of Naval Education and Training, Aviation Physiology Curriculum, Code N-424, NAS Pensacola, FL 32508, autovon 922-4721/4387 or FTS 948-4721/4387.

Ed's note: A printer's error crept into last month's issue on page 43. In the photo of the three helicopters, obviously the Navy Seasprite is in the foreground, not center. Hold the cards and letters, please.

VB-103/VPB-103

I am a former member of VB-103 (later redesignated VPB-103) which flew PB4Y-1 *Liberators* out of Dunkeswell, England, on antisubmarine patrols during WW II. I am anxious to hear from anyone stationed at Dunkeswell who has information, anecdotes or photos relating to such subjects as the then secret Zombie bombs we carried, unusual flights and/or contacts with German submarines, information relative to the fate of Joseph Kennedy and his crew, and unusual liberty spent in the neighboring towns Taunton, Exeter, London, Edinburgh, etc.

My goal is to develop several articles or possibly a book highlighting this little-recognized phase of an extremely important part of the war of the Allies versus the German submarine threat.

Bill Turner, Managing Editor
The Air Reservist magazine
Bolling AFB, DC 20332

Reunions, Conferences, Boards, etc.

Selection boards, 1982: Aviation Command Screening, October 18, 12 days; Aviation Captain Command Screening, November 15, 9 days; TAR Aviation Captain Command Screening, November 18, 1 day; and LDO Aviator, November 29, 5 days.

Tactical Warfare Symposium, October 5-7, 1982, NAS Whidbey Island, Wash. For details, contact Lt.Cdr. Carl Beaudet, autovon 820-2093/2793 or commercial (206) 257-2093/2793. Invitations will be mailed to those who attended last year.

First Woman Designated Naval Aviator Dies in Plane Crash

In a way, Lieutenant Commander Barbara Allen Rainey was a pioneer in Naval Aviation. She became one when she earned her wings in February 1974 as the first woman designated a Naval Aviator, but her trailblazing career ended tragically on July 13 in a fatal aircraft accident during a training flight near Evergreen, Ala. Also killed in the crash was her student pilot, Ensign Donald Knowlton. They were flying a T-34C turboprop from Whiting Field, Milton, Fla., practicing touch-and-go landings and takeoffs, when the plane crashed into the woods during an approach.

Commissioned December 18, 1970, Rainey served a tour at NAB Little Creek, Va., from March 1971 to July 1972, before being assigned to the staff of the Supreme Allied Command, Atlantic, in Norfolk. She reported to Pensacola for flight training in February 1973 where she met her husband, now Lieutenant Commander John Rainey. After receiving her wings a year later, she began a tour of duty with VR-30 at NAS Alameda flying C-1As. In November 1977, Rainey transferred to the Naval Air Reserve and flew with VR-53 at Dallas for four years. Her two daughters, Cynthia and Katherine, were born during this period. She came back on active duty in October 1981 and was an instructor with Training Squadron Three until her death.

From childhood Rainey was familiar with Navy life. Her father is a retired Navy commander and her brother was a Marine Corps pilot. Lt.Cdr. John Rainey is a flight instructor at Whiting Field.

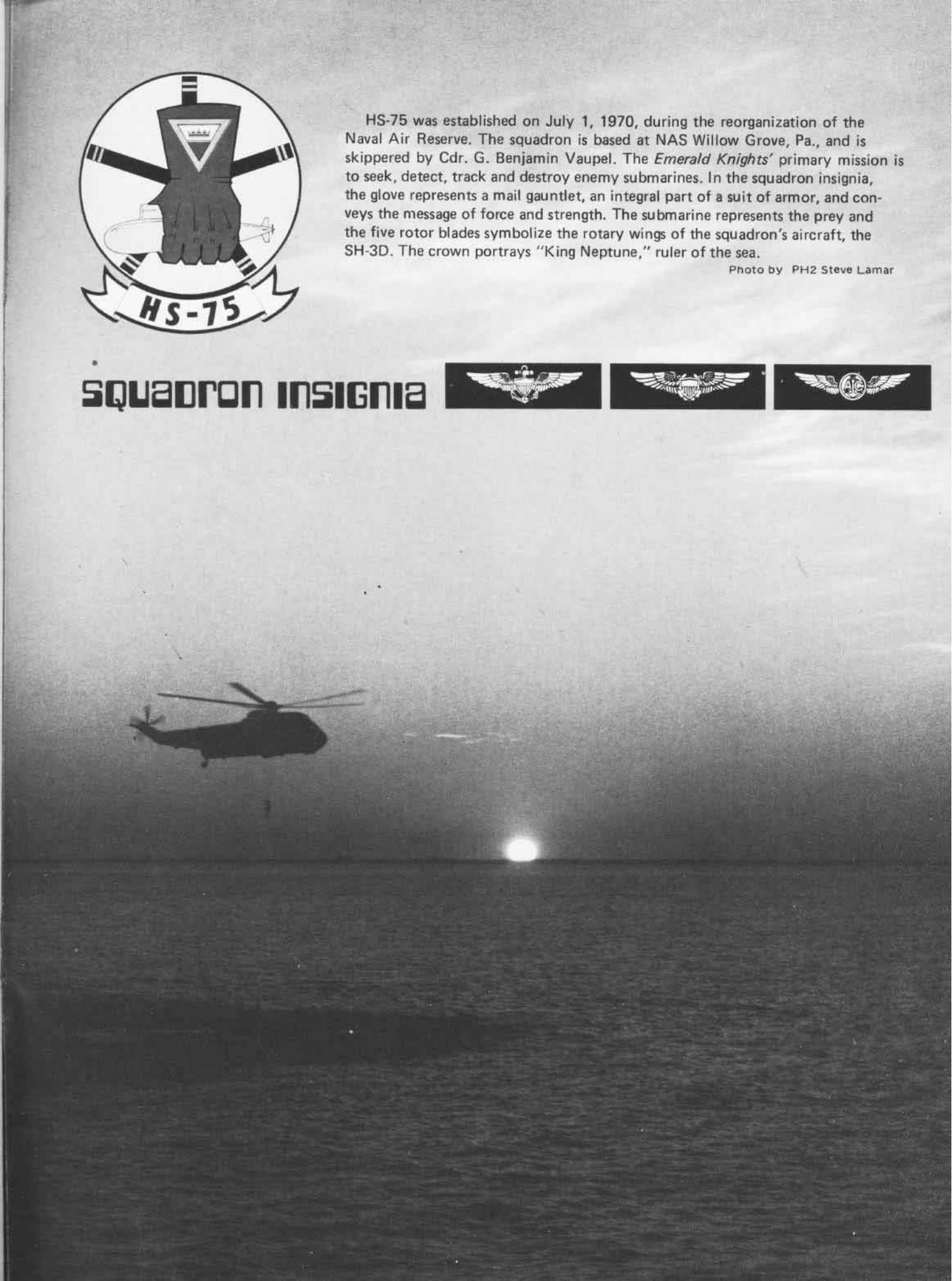
Barbara Rainey will be remembered as an outstanding naval officer and a respected Naval Aviator.

Several days before Lt.Cdr. Rainey's fatal crash, student pilot Ensign Cary P. Jones became the Navy's first woman pilot and the first woman graduate of the U.S. Naval Academy to be killed in an aircraft mishap, when two T-44A turboprops collided in midair over Cabaniss Field, Corpus Christi, killing two instructors and four students.

HS-75 was established on July 1, 1970, during the reorganization of the Naval Air Reserve. The squadron is based at NAS Willow Grove, Pa., and is skippered by Cdr. G. Benjamin Vaupel. The *Emerald Knights'* primary mission is to seek, detect, track and destroy enemy submarines. In the squadron insignia, the glove represents a mail gauntlet, an integral part of a suit of armor, and conveys the message of force and strength. The submarine represents the prey and the five rotor blades symbolize the rotary wings of the squadron's aircraft, the SH-3D. The crown portrays "King Neptune," ruler of the sea.

Photo by PH2 Steve Lamar

SQUADRON INSIGNIA



naval aviation news